



**Institute of Nutrition of Central America
and Panama (INCAP/PAHO)**

**Hospital General de Occidente
San Juan de Dios**

**Obstetric Management
Protocols for
Regional - Departmental
Hospitals**



*Quetzaltenango Maternal
and Neonatal Health Project*

MotherCare™

MotherCare Project/John Snow, Inc.

Guatemala, 1993

**Institute of Nutrition of Central America and Panama (INCAP/PAHO)
Hospital General de Occidente San Juan de Dios
Department of Gynecology and Obstetrics**

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INTRODUCTION

These protocols represent a guide for the treatment of patients in the outpatient clinics, labor and delivery ward, and postpartum service of the Department of Obstetrics of the Hospital General de Occidente San Juan de Dios, Quetzaltenango. The purpose of these protocols is to serve as a standard of care in the management of patients, and thus as an aid in the maintenance of an optimal level of medical care.

The Hospital General de Occidente San Juan de Dios is a teaching institution, and as such must have standardization of care in order to educate students and residents in the best manner possible. The protocols constitute models for patient management. However, they are not a substitute for a medical text nor for a meticulous review of pathologic conditions.

This document was produced for all personnel who are charged with the care of patients in these services: graduate and auxiliary nurses, medical residents, medical students and attending obstetricians.

We are all responsible for being well informed about the risk factors, diagnostic evaluation, clinical course and treatment of obstetric conditions and diseases. Only then may we offer optimal care to our patients.

The following points are important in the use of these protocols:

- Read the protocols in their entirety before the need to use them arises.
- Be familiar with the medications, their dosages, routes of administration, secondary effects and antidotes (if they exist).
- Use common sense when making decisions.
- Consult immediate superiors for their administrative skills, experience and knowledge.
- **ANTICIPATE** problems.
- Always remember that our patients are human beings who deserve to be treated with respect and kindness. They should be informed about their (or their baby's) condition and plans for treatment in language or words that they can understand.
- Always act with responsibility, dedication, efficiency, professional honor, the desire for self improvement, and respect for personal dignity and human life.

1. PRENATAL CARE

□ **DEFINITION:**

- Prenatal care includes activities for monitoring the pregnancy, educating the mother, and detecting and treating problems in an early and appropriate manner. The goal of prenatal care is to ensure a healthy mother and newborn.

A. ROUTINE PRENATAL CARE

- The schedule of visits is:
 - 1 - 27 weeks gestation = every month
 - 28 - 35 weeks gestation = every 2 weeks
 - 36 weeks - term = every week
- Routine laboratory examinations:
 - **First visit:**
 - Complete blood count
 - Urinalysis
 - Stool for ova and parasites
 - Blood type and Rh
 - VDRL
 - Preprandial blood glucose
 - **24-28 weeks:**
 - 1 hour post prandial blood glucose
 - **36 weeks:**
 - Hematocrit
 - Urinalysis
 - VDRL

- **Patient's history - Essential questions:**
 - Date of last menstrual period (and calculation of gestational age)
 - Age
 - Parity
 - Medical history
 - Family history (twins, diabetes, pre-eclampsia, congenital anomalies)
 - Obstetrical history
 - Presence of: nausea, vomiting, vaginal discharge, hemorrhage, hydorrhea, fetal movements, uterine contractions, headache, blurred vision, spots before eyes, dizziness, epigastric pain, diarrhea, pain, edema(swelling).
(The last point should be reviewed at each visit).

- **Minimal Physical Parameters to be Evaluated:**
 - **1st visit:**
 - Complete physical examination, including fundal height
 - **Every visit:**
 - Blood pressure
 - Weight
 - Fundal height or uterine size (< 20 weeks)
 - Fetal heart rate (> 20 weeks)
 - Presence of edema
 - Patellar reflex
 - Fetal presentation and lie (> 28 weeks)
 - Others according to history elicited at each visit.

* Every patient should be examined by a resident or intern.

- **Basic Educational Plan for the Patient:**
 - **1st trimester:**
 - Adequate nutrition
 - Signs of abortion
 - Nausea and vomiting
 - Urinary symptoms
 - **2nd trimester:**
 - Adequate nutrition
 - Vaginal bleeding or discharge
 - Premature labor
 - Premature rupture of the membranes
 - Signs of pre-eclampsia
 - Urinary symptoms

- **3rd trimester:**
 - Adequate nutrition
 - Normal labor, hospital routine
 - Signs of pre-eclampsia
 - Vaginal bleeding or discharge
 - Premature labor
 - Premature rupture of the membranes
 - Prolonged labor
 - Abnormal birth (breech, twin, transverse, cesarian section)
 - Urinary symptoms

B. RISK FACTORS IN PREGNANCY, THEIR POTENTIAL ADVERSE EFFECTS AND CLINICAL FOLLOW-UP*

RISK FACTORS FOR EVALUATION	POTENTIAL ADVERSE EFFECTS FOR THE CURRENT PREGNANCY	CLINICAL ACTIVITIES
A. PERSONAL FACTORS		
Less than 16 years old	Unplanned pregnancy, poor clinic attendance, premature labor.	Intensive and repetitive education about health and pregnancy, early diagnosis and referral of premature labor.
More than 35 years old	Downs syndrome, fetoplacental dysfunction.	Prenatal education, examinations of fetoplacental function, ultrasound, genetic amniocentesis.
Lives far from hospital or delivery site	Birth in route to hospital, neonatal asphyxia or hypothermia.	Scheduled admission before labor.

* Adapted from: Boddy, F. *A Schematic Approach to Antenatal Care*, 1983.

RISK FACTORS FOR EVALUATION	POTENTIAL ADVERSE EFFECTS FOR THE CURRENT PREGNANCY	CLINICAL ACTIVITIES
B. OBSTETRICAL HISTORY		
Primigravida 30 years old or more (if all previous pregnancies have ended in abortion, include patient here)	Pregnancy associated hypertension, fetoplacental dysfunction.	Creatinine and BUN at first visit. Serial examinations of fetoplacental function.
Parity of 5 or more (5 or more pregnancies greater than 20 weeks)	Fetoplacental dysfunction, postpartum hemorrhage.	Serial examinations of fetoplacental function, active management of 3rd stage of labor.
Infertility with medical treatment	Anxiety during pregnancy.	Reassurance via careful prenatal care, rule out multiple or ectopic pregnancy. Consider ultrasound.
Intrauterine or neonatal death	Depends on the cause of death: fetal malformation, prematurity, placental dysfunction.	Determine the cause of death from previous records. Fetoplacental evaluation, TORCH titers, or glucose tolerance test may be indicated.
Small for gestational age	Newborn small for gestational age, fetoplacental dysfunction.	Ultrasound if date of LMP is in doubt. Evaluation of fetoplacental function and fetal growth may be indicated.
Large for gestational age	Gestational diabetes, large fetus, dystocia, birth trauma.	Glucose tolerance test during pregnancy, pre- and post-prandial glucose (according to case) and intensive care during labor.

RISK FACTORS FOR EVALUATION	POTENTIAL ADVERSE EFFECTS FOR THE CURRENT PREGNANCY	CLINICAL ACTIVITIES
Fetal abnormality	Congenital malformation, hereditary disorder.	Discuss case with neonatologist prior to 14 weeks gestation, alpha fetoprotein at 14 weeks, genetic counselling. Consider ultrasound and genetic amniocentesis.
Antibodies in previous pregnancies, or Rh negative	Rh or other feto-maternal incompatibility	Indirect Coombs early in pregnancy and every 4 weeks between 18-36 weeks, serial ultrasound examinations.
Hypertension/ Eclampsia	Pregnancy associated hypertension, renal disease, fetoplacental dysfunction.	Check at first visit: weight, fundoscopic examination, creatinine, BUN, uric acid, proteinuria, roll over test. Monitor for signs of pre-eclampsia.
Spontaneous abortion, premature labor, previous cervical cerclage	Incompetent cervix, premature labor.	Serial cervical examinations or cervical cerclage may be indicated. Early diagnosis of cervical dilation and premature labor.
Previous cesarian section	Uterine rupture.	Scheduled admission to hospital at term. Discuss route of delivery.
Postpartum hemorrhage, retained placenta	Recurrence of the problem.	Delivery in specialized hospital.
Duration of labor less than 4 hours	Delivery on the way to the hospital, neonatal asphyxia and/or hypothermia.	Scheduled admission before labor.

RISK FACTORS FOR EVALUATION	POTENTIAL ADVERSE EFFECTS FOR THE CURRENT PREGNANCY	CLINICAL ACTIVITIES
C. MEDICAL HISTORY		
Hypertension/ proteinuria (BP 140/90 or proteinuria on 2 or more nonpregnant occasions)	Hypertension in pregnancy, renal disease, fetoplacental dysfunction, chronic hypertension.	Examinations for mild pre-eclampsia at 1st visit. Hypotensive drugs may be indicated. Continue hypotensive drugs if the patient is taking them with good control of her pressure. Serial evaluations of fetoplacental function.
Maternal weight less than 100 pounds	Fetoplacental dysfunction.	Serial evaluations of fetoplacental function may be indicated. Counseling on diet.
Maternal weight more than 150 pounds	Gestational diabetes, arterial hypertension.	Counseling on diet or consultation with a dietician. glucose tolerance test during pregnancy, creatinine and BUN at 1st visit.
Heart murmur	Cardiac disease.	Consultation with cardiologist.
Chronic illness	The illness may affect the pregnancy or vice versa.	Plan of management agreed upon by obstetrician, medical doctor and neonatologist.
Uterine anomalies including uterine fibroid	Premature labor, malpresentation, degeneration of fibroid, risk of abortion. Postpartum hemorrhage.	Ultrasound, bedrest, tocolytics for increased uterine activity, evaluation of fetoplacental function.
Detection of other pelvic masses	Uterine fibroid or ovarian cysts. Intrauterine growth retardation.	Ultrasound.

RISK FACTORS FOR EVALUATION	POTENTIAL CAUSES OR ADVERSE EFFECTS FOR THE CURRENT PREGNANCY	CLINICAL ACTIVITIES
D. FAMILY HISTORY		
Family history of fetal abnormality	Fetal malformation.	Discuss case with neonatologist prior to 14 weeks gestation, alpha fetoprotein at 14 weeks, genetic counselling. Consider ultrasound and genetic amniocentesis. Glucose tolerance test during pregnancy.
Family history of diabetes	Gestational diabetes.	
E. CURRENT OBSTETRIC CONDITIONS		
Unknown last menstrual period	Gestational age unknown.	Clinical evaluation of gestational age. Consider ultrasound.
Vaginal bleeding since last period	1st trimester bleeding: -Threatened abortion -Missed abortion -Ectopic pregnancy -Molar pregnancy	Ultrasound, hematology, urinalysis, creatinine. Urinary chorionic gonadotropin. X-ray of thorax (if there is a molar pregnancy).
Leucorrhoea	Ruptured membranes, neonatal infection.	Wet mount and culture of vaginal secretion, test for arborization (ferning), test with Nitrazine paper.
Uterus smaller or larger than gestational age by LMP (up to 20 weeks)	Intrauterine death, multiple gestation, molar pregnancy, intrauterine growth retardation, missed abortion, incorrect last menstrual period.	Ultrasound or abdominal X-ray, evaluation of fetoplacental function, serial blood or urinary chorionic gonadotropin.

Absence of fetal movements	Uncertain last menstrual period, molar pregnancy, fetal death.	Doppler, ultrasound or X-ray.
Hemoglobin less than 10 g%	Anemia in pregnancy.	Peripheral blood smear, serum iron and folic acid, consultation with hematologist. Iron and folic acid supplementation.
Poor weight gain (less than 1 lb/week) after 30 weeks, loss of weight (since last visit)	Fetoplacental dysfunction.	Serial evaluation of fetoplacental function if expected growth of fundal height is not seen. Dietary recommendations.
Excessive weight gain	Pre-eclampsia, multiple pregnancy, gestational diabetes.	Ultrasound, glucose tolerance test, examinations of mild pre-eclampsia, dietary recommendations.
Proteinuria (more than one plus)	Urinary infection, renal disease, pre-eclampsia.	Uric acid, urinalysis and urine culture, creatinine and BUN.
Glucosuria	Lowered renal threshold, gestational diabetes.	Glucose in the 2nd urine of the day is indication for glucose tolerance test.
Bacteriuria (more than 100,000 bacteria in urine culture)	Pyelonephritis.	Antibiotic therapy, BUN, creatinine.
Blood pressure greater than 160/100	Pregnancy associated hypertension, renal disease, fetoplacental dysfunction.	Examinations for severe pre-eclampsia, evaluate fetoplacental function, bedrest. Consider hospitalization.
Anti Rh antibodies	Rh isoimmunization.	Indirect Coombs every 4 weeks. Serial ultrasound.

Uterus large for gestational age, after 20 weeks	Large fetus, multiple pregnancy, hydramnios, incorrect gestational age.	Ultrasound or abdominal X-ray, blood glucose.
Uterus small for gestational age, no fundal height growth	Incorrect gestational age, fetoplacental dysfunction, intrauterine growth retardation, fetal death.	Ultrasound, serial evaluation of fetoplacental function after 28 weeks.
Excess amniotic fluid	Fetal malformation, premature labor.	Ultrasound or abdominal X-ray. Consider admission depending on case.
Head not engaged at 40 weeks in primigravida	Cephalopelvic disproportion in labor.	Delivery in specialized hospital. Estimation of pelvic size.
Third trimester vaginal bleeding	Placenta previa, abruptio placenta.	Ultrasound, evaluation of fetoplacental function, bedrest, consider hospitalization. Serial Hct/Hb, coagulation profile.
Premature labor	Premature birth.	Admit to hospital for tocolysis and fetal monitoring.
Fetal malpresentation (after 34 weeks)	Malpresentation in labor, dystocia, uterine rupture, cord prolapse.	External cephalic version may be indicated in some cases. Rule out congenital anomalies. Scheduled admission. Maternal education.

C. ABNORMAL PRESENTATIONS IN PREGNANCY

BREECH PRESENTATION

DEFINITION:

- Fetus in a longitudinal lie presenting with the feet or buttocks.

RISK FACTORS:

- Congenital anomalies (eg. anencephaly), uterine tumors or anomalies, prematurity, multiple pregnancy, placenta previa, polyhydramnios, grand multipara.

PRINCIPAL CLINICAL SIGNS:

- Fetal head palpable in the maternal upper abdomen.
- Fetal movements felt primarily below the umbilicus.

DIAGNOSTIC EXAMINATIONS:

- Ultrasound.
- Plain abdominal X-ray.

MANAGEMENT:

- **Gestational age ≥ 36 weeks:**
 - Ultrasound to confirm gestational age, attitude of fetal head, fetal weight, and to rule out congenital anomalies.
 - Weekly vaginal examination; admit to prenatal ward if cervical changes suggest imminent labor, if access to the hospital is a problem, or if the patient is unlikely to return to admission.
 - Educational plan regarding early admission to hospital, possibility of abdominal delivery and exercises (knee-chest, 3 times a day, 15 minutes each time).
- **Gestational age < 36 weeks:**
 - Educational plan regarding early admission to hospital, possibility of abdominal delivery and exercises (knee-chest, 3 times a day, 15 minutes each time).

TWIN PREGNANCY

DEFINITION:

- A pregnancy with two fetuses.

RISK FACTORS:

- Family history, elderly multipara, ovulation induction.

PRINCIPAL CLINICAL SIGNS:

- Discrepancy between fundal height and gestational age of 4 cm or more between 22 and 35 weeks gestation. Auscultation of two distinct fetal heart rates.

DIAGNOSTIC EXAMINATIONS:

- Ultrasound
- Plain abdominal X-ray.

MANAGEMENT:

- Iron and folic acid supplementation.
- Prenatal visits every two weeks between 20 and 28 weeks gestation.
- Weekly prenatal visits from 28 weeks gestation on.
- Avoid heavy work and increase rest after 28 weeks.
- Glucocorticoid: dexamethasone or betamethasone 12 mg IM every 12 hours for 2 doses, beginning at 28 weeks gestation and continuing weekly until 34 weeks gestation.
- Serial ultrasound examinations, documenting:
 - Weight of each fetus.
 - Presence of one or two amniotic sacs.
 - Location and number of placentas.
 - Presentation of each twin.
- Ultrasound exam at term (38 weeks) with biophysical profile and all the above mentioned parameters.

- Evaluation of fetal well-being weekly beginning at 34 weeks.

TRANSVERSE LIE

DEFINITION:

- The fetus lies with its long axis across the long axis of the uterus.

RISK FACTORS:

- Prematurity, lax abdominal wall, polyhydramnios, placenta previa, cephalo-pelvic disproportion, pelvic tumor (fibroid, ovarian tumor), multiple pregnancy, congenital uterine abnormality.

PRINCIPAL CLINICAL SIGNS:

- The "transverse" shape of the uterus.
- The head lies on one side of the abdomen, with the breech on the other side.
- The shoulder is presenting, but the pelvic brim is empty.

DIAGNOSTIC EXAMINATIONS:

- Ultrasound.
- Plain abdominal X-ray.

MANAGEMENT:

- **Gestational age 32-36 weeks:**
 - Weekly prenatal visits.
 - Educate the woman regarding the baby's position and ask her to report to hospital at the first sign of labor or when the membranes rupture.
- **Gestational age > 36 weeks:**
 - Consider the possibility of prematurity: estimate the gestational age as accurately as possible. If the gestation is less than 36 weeks, review the woman in one or two weeks.

- Consider the possibility of twins: carefully re-examine the abdomen, and if necessary do an ultrasound or abdominal x-ray. If twins are found, manage as such.
- Consider the possibility of abdominal pregnancy. On bimanual (vaginal-abdominal) palpation the empty uterus is felt as separate from the gestational sac. If an abdominal pregnancy is found, laparotomy is indicated.
- If prematurity and twins have been ruled out, careful education regarding the baby's position and admission of the woman to the hospital. After a few days in the hospital, one of two situations will become clear:
 1. a "fixed" transverse lie: the baby is always in the same position. Whatever the cause, vaginal delivery is impossible: arrange for elective cesarian section at 38 weeks.
 2. an "unstable" lie, when the baby's position keeps changing.
- If placenta previa is diagnosed, arrange for elective cesarean section at 38 weeks or earlier, in case of antepartum hemorrhage.
- If, in the other cases, a lax abdominal wall, an excessive amount of liquor or unrecognized prematurity are likely causes, vaginal delivery may be possible but:
 - palpate the abdomen daily
 - instruct the woman to report the first sign of labor and/or rupture of membranes.

2. BLEEDING IN PREGNANCY

A. BEFORE 20 WEEKS GESTATION

DEFINITION:

- Bleeding from the reproductive tract during pregnancy before 20 weeks gestation.

RISK FACTORS:

- Ectopic pregnancy, threatened or inevitable abortion, trauma, tumors, infection.

PRINCIPAL CLINICAL SIGNS:

- Vaginal bleeding that is light (spotting), moderate (like a menstrual period), or heavy. It can present as a brown or maroon vaginal discharge. It may be accompanied by lower abdominal pain and signs of hypotension.

LABORATORY EXAMINATIONS:

- Hematocrit, complete blood count
- Urinalysis
- Ultrasound
- Blood or urine chorionic gonadotropins (serial, every 48 hours).

MANAGEMENT:

- Complete history, including the date of the last and the penultimate menstruation, the pattern and amount of the bleeding, the presence and type of pain, dizziness, urinary symptoms etc. Also, any history of reproductive tract infections.
- Meticulous examination of the external genitalia and vagina for signs of trauma, infection etc.

- **Speculum examination documenting:**
 - The presence of blood or products of conception in the vagina or cervix;
 - The condition of the cervix:
 - open or closed
 - cervicitis
 - products of conception visible.

- **Bimanual examination documenting:**
 - Condition of cervix (open or closed);
 - Size, shape and consistency of uterus;
 - Presence of pain and/or adnexal masses.

- Obtain laboratory examinations and diagnostic studies as necessary (see Diagnostic Laboratory Examinations, above).

- **If the cervix is open** (even if the patient has not passed any products of conception):
 - **Before 12 weeks:** Consider incomplete or inevitable abortion, or molar pregnancy. Conduct in these cases is a CURETTAGE in the operating room.
 - **After 12 weeks:** Consider incompetent cervix, incomplete or inevitable abortion, or molar pregnancy.
 - Ultrasound examination. A gestational sac should be visible in a normal pregnancy six weeks after the last menstrual period and when blood chorionic gonadotropins are equal to or greater than 6,000 mIU/ml.
 - Blood chorionic gonadotropins double every two days in 66% of normal pregnancies. If the level is decreasing or has plateaued, consider an ectopic pregnancy or a blighted ovum. Rule out a molar pregnancy if the levels of chorionic gonadotropins are very high (more than 100,000 mIU/ml serum or 1,000,000 IU/liter urine).
 - For cervical incompetence, the management is cervical CERCLAGE.

- For threatened abortions, admit the patient and follow expectant management; if symptoms worsen, evacuate the uterus. CURETTAGE after the expulsion or evacuation of the products of conception.
- If there is a molar pregnancy --> SUCTION CURETTAGE in the operating room, with blood available for transfusion if it becomes necessary. Begin oxytocin infusion when 2/3 of the uterine volume have been evacuated. Be prepared for an emergency laparotomy in case there is uncontrollable hemorrhage.
- **If the cervix is closed** ---> consider ectopic pregnancy, threatened or missed abortion, and molar pregnancy:
 - Ultrasound examination. A gestational sac should be visible in a normal pregnancy six weeks after the last menstrual period and when blood chorionic gonadotropins are equal to or greater than 6,000 mIU/ml.
 - Blood chorionic gonadotropins double every two days in 66% of normal pregnancies. If the level is decreasing or has plateaued, consider an ectopic pregnancy or a blighted ovum. Rule out a molar pregnancy if the levels of chorionic gonadotropins are very high (more than 100,000 mIU/ml serum or 1,000,000 IU/liter urine).
 - If there is a high suspicion of an ectopic pregnancy, or if the diagnosis is in doubt
 - > LAPAROSCOPY with further management according to findings.
 - If a diagnosis of threatened abortion is made, recommend bedrest and no sexual relations. Follow weekly in the outpatient clinic. Serial examinations of hematocrit and chorionic gonadotropins are useful.
 - In the case of a missed abortion, the management is CURETTAGE.
 - If there is a molar pregnancy --> SUCTION CURETTAGE in the operating room, with blood available for transfusion if it becomes necessary. Begin oxytocin infusion when 2/3 of the uterine volume have been evacuated. Be prepared for an emergency laparotomy in case there is uncontrollable hemorrhage.
- **If there is cervicitis**, urinary infection or signs of external trauma ---> TREAT locally or with appropriate antibiotics.

IMPORTANT CONSIDERATIONS:

Remember that a patient can lose a lot of blood little by little. Monitor for signs of hypovolemia and tell patients to consult the hospital if they become dizzy or suffer from nausea, vomiting or faintness.

The key to good treatment is an early diagnosis. The key to an early diagnosis is a high clinical suspicion. **THINK** of an ectopic or molar pregnancy when a patient presents with bleeding prior to 20 weeks gestation.

B. AFTER 20 WEEKS GESTATION

DEFINITION:

- Bleeding from the reproductive tract during pregnancy after 20 weeks gestation. This bleeding must be considered due to a placenta previa or abruptio placenta until proven otherwise.

RISK FACTORS:

- Placenta previa, abruptio placenta, trauma, tumors, infection, vasa previa.

PRINCIPAL CLINICAL SIGNS:

- Vaginal bleeding that is light (spotting), moderate (like a menstrual period), or heavy. It can present as a brown or maroon vaginal discharge. It may be accompanied by lower abdominal pain and signs of hypotension.
- With placenta previa, there is usually no pain and the uterus is soft. The principal danger in placenta previa is blood loss when labor begins, or during contractions prior to the initiation of true labor.
- In the case of abruptio placenta, the uterus may be painful and tense (as if it were a tetanic contraction) in addition to the presence of vaginal bleeding. There are often signs of hypovolemia (tachycardia, hypotension, nausea and vomiting, oliguria and even shock) in the absence of a lot of visible external hemorrhage. Coagulopathies occur in 30% of cases where the abruptio is severe enough to kill the fetus. Port wine colored amniotic fluid suggests a placental abruptio.

LABORATORY EXAMINATIONS:

- Hematocrit, complete blood count with platelet count
- Urinalysis
- Ultrasound
- Fibrinogen, partial thromboplastin time, prothrombin time (in cases of abruptio placenta).

MANAGEMENT:

- Complete history, including the date of the last menstruation, the pattern and amount of the bleeding, the presence and type of pain, signs and symptoms of hypovolemia (nausea, vomiting, dizziness, pallor, diaphoresis), the presence or absence of fetal movements, and any urinary symptoms.
- Meticulous examination of the external genitalia and vagina for signs of trauma, infection etc.
- Ultrasound examination, looking for placental location and the presence of any retroplacental clots.
- If the ultrasound examination demonstrates a **PLACENTA PREVIA** or a low lying placenta:
 - Hospitalization with complete bedrest.
 - Hemoglobin and hematocrit twice a week with blood transfusions as needed to keep hematocrit above 30%.
 - Daily evaluation of fetal well-being with fetal movement counts or Non-Stress Test (NST) fetal monitoring, or twice weekly with a biophysical profile.
 - Serial ultrasound examinations every 4 weeks documenting fetal growth and placental location.
 - Delivery via cesarian section when any of the following conditions are present:
 - Fetal pulmonary maturity is documented by amniocentesis,
-OR-
 - 38 weeks gestation are completed,
-OR-
 - There is uncontrollable hemorrhage,
-OR-
 - There is another obstetric or medical indication (ex: pre-eclampsia, evidence of severe fetal compromise, etc.).
 - Have available 1 or 2 units of blood during the hospital stay if possible, and always have this available in the operating room at the time of the cesarian section.
 - Be prepared for uterine atony (have oxytocin, ergotrate and prostaglandins on hand) and for the possibility of a placenta accreta (be ready to perform an emergency hysterectomy).

- If there is uncertainty about the diagnosis of a placenta previa, or if an ultrasound examination is not available, the patient should be treated as if she had a placenta previa. When labor begins, a vaginal examination must be performed to see if there is placenta covering the cervix and impeding the birth of the baby. This examination must always take place in the operating room, with everything ready to perform an emergency cesarian section (anesthesiologist, nurses, instruments open and counted, blood available) and for the management of a severe hemorrhage (two intravenous lines etc.). This examination can provoke catastrophic bleeding in the presence of a placenta previa, and only if everything is ready for immediate action can the mother's and baby's lives be saved. If the placenta is not felt on vaginal examination the patient may be allowed to labor, always monitoring her for hemorrhage.

- If an ABRUPTIO PLACENTA is diagnosed clinically or on ultrasound examination:
 - Hospitalization with complete bedrest.
 - Rapid evaluation of the maternal condition, including orthostatic vital signs, abdominal examination, fundal height measurement, and evaluation of other possibly co-existing conditions (pre-eclampsia, chronic hypertension, etc.).
 - Diagnose whether the patient is in labor.
 - Intravenous line x 2 : one of these should be central in moderate and severe cases, or if pre-eclampsia, chronic hypertension or other associated condition exists.
 - Obtain laboratory examinations (see orders).
 - Insert Foley's catheter.
 - Oxygen via nasal catheter.
 - Evaluate fetal state: alive or dead, presence of fetal distress, gestational age.
 - With a mild abruptio and an immature fetus, management is conservative. In all other cases the fetus must be delivered, preferably vaginally:
 - Amniotomy in all patients.
 - Continuous monitoring of fetal heart rate and uterine activity.
 - Oxytocin augmentation when necessary, but with caution (the uterine response to oxytocin may be erratic, and there is an increased chance of uterine rupture, especially in multiparas).
 - Cesarean section for obstetrical indications (fetal distress, failure to progress in labor). Give fresh frozen plasma and platelets to patients with coagulopathies who are going to be operated upon.

- Aggressive transfusions of whole blood or packed red blood cells, using urinary output (greater than 30ml/hr) and central venous pressure (12-15cm/H₂O as guides. (DO NOT USE the observed blood loss as a guide for transfusion. This will almost always underestimate the actual loss in a patient with abruptio placenta.)
- **OTHER CAUSES**
 - Other obstetric causes of antepartum hemorrhage are vasa previa, placental edge bleeding, ruptured uterus. Gynecological causes include carcinoma of the cervix, cervical polyp or erosion, trichomonas vaginitis and vaginal varicosities.

□ **COMPLICATIONS**

- **PLACENTA PREVIA**
 - Up to 15% of patients with a placenta previa will also have a placenta accreta. There is a high risk of mortality, and in most cases a hysterectomy is the only way to save the mother's life.
- **ABRUPTIO PLACENTA**
 - When the clinical diagnosis is clearly abruptio placenta, or in the presence of acute fetal distress, do not waste valuable time obtaining an ultrasound examination. Ultrasound is neither a sensitive nor a specific diagnostic modality in abruptio placenta.
 - The principal cause of maternal death is renal failure due to prolonged hypotension. Do not underestimate the amount of internal hemorrhage; a central venous or Swan-Gantz catheter is essential, as is the strict monitoring of urine output.
 - A 50% abruptio is sufficient to cause fetal death. In the presence of a dead fetus, the average blood loss is 2500ml, and the possibility of a coagulopathy is 30%. These patients need massive blood transfusions to save their lives. A coagulopathy severe enough to cause Disseminated Intravascular Coagulopathy is seen almost exclusively when the fetus is dead. However, the coagulopathy resolves without treatment in a matter of days once delivery has taken place.
 - Other complications are uterine atony due to blood in the myometrium (Couvelaire uterus) and amniotic fluid emboli. If there is blood in the myometrium but the uterus is well contracted, a hysterectomy is not necessary.

- Intrauterine growth retardation is more frequent in fetuses of mothers with abruptio placenta. Determine the gestational age carefully before formulating a plan of management.
- Within the differential diagnosis of abruptio placenta, consider appendicitis, pyelonephritis, rupture of the uterus and spleen.

IMPORTANT CONSIDERATIONS:

When a patient with antepartum hemorrhage presents, first decide whether she is an emergency requiring immediate investigation and treatment. If she is bleeding heavily per vaginam or internally, or if she is in labor, it is an emergency.

Minor antepartum hemorrhage is common. Ideally, all patients with minor antepartum hemorrhage should be examined by ultrasound but this may not always be possible. The patient should be hospitalized until placenta previa has been ruled out with certainty.

C. ADMISSION ORDERS - BLEEDING AFTER 20 WEEKS

Admit to labor and delivery ward.

Diet:

- Nothing By Mouth.

Absolute bedrest in left lateral or semifowler position.

Record orthostatic vital signs, then vital signs every hour:

- Blood pressure
- Pulse
- Fetal heart rate
- Central venous pressure (if case merits this)
- Respirations
- Uterine activity

Observations:

- Psychological attitude
- Hydration
- Changes in conduct
- Hypo-hyperthermia
- Hypo-hypertension
- Tachypnea-tachycardia
- Vaginal bleeding
- Abdominal distension

Laboratory examinations:

- Complete blood count (hemoglobin, hematocrit, differential, sedimentation rate)
- Blood type and Rh
- Blood chemistries and hepatic function tests:
 - Creatinine, BUN
 - Sodium, potassium
- Coagulation profile
 - Prothrombin time and partial thromboplastin time
 - Platelet count
 - Fibrinogen
 - Clot retraction time

Medications:

- According to patient's condition.

Treatment:

- I.V. fluids - saline or Hartmann's at 125 ml/hour (evaluate according to patient's requirements).
- Whole blood or packed red blood cells; according to patient's loss, urinary output and central venous pressure - keep Hct. above 30%.
- Record intake and output every hour.
- Foiey catheter.
- Intravenous angiocath No.16-18.
- Placement of central line and notation of central venous pressure every 30 minutes PRN.
- Oxygen via nasal cannula 4-8 liters/min.
- Obstetrical ultrasound.

Present patient to chief on call and then to chief of service.

Report any changes immediately.

3. PRE-ECLAMPSIA / ECLAMPSIA

DEFINITION:

- A rise in blood pressure in a pregnant woman accompanied by proteinuria, edema or both. The edema may manifest as an abnormal weight gain. A rise in blood pressure is defined as 30 mm Hg systolic or 15 mm Hg diastolic above the patient's baseline, demonstrated on two different occasions at least 6 hours apart. If the patient's baseline blood pressure is unknown, a blood pressure of 140/90 mm Hg after the 20th week of gestation is considered abnormal.

RISK FACTORS:

- First pregnancy, diabetes, chronic hypertension, multiple pregnancy, molar pregnancy, family history of pre-eclampsia, renal disease.

MILD PRE-ECLAMPSIA

Diagnostic Parameters for Mild Pre-eclampsia

- Weight gain of more than 4 pounds per month (or one pound per week).
- Blood pressure of 140/90 or a rise in systolic blood pressure of 30 mm Hg and a rise in diastolic blood pressure of 15 mm Hg compared to previous recording.
- Proteinuria not greater than 2 grams/24 hours.

MANAGEMENT:

- *Ambulatory*
- Weekly clinic visit (urinalysis, physical examination, BP, weight).
- Modified bedrest in semifowler or left lateral positions.
- Normal diet.

- **Laboratory examinations**
 - Complete blood count with differential, type and Rh
 - Urinalysis
 - Blood urea nitrogen
 - Creatinine
 - Uric acid
 - Blood glucose

If there is proteinuria, get 24 hour urine for total protein.
Platelet count.

- **Medications:**
 - Tranquilizer - Phenobarbital 50 mg p.o. every 12 hours. Re-evaluate use weekly.
- **Funduscopy examination**

Patients not in labor:

- If the patient presents to the outpatient clinic, monitor her with weekly visits, including urinalysis, weight, BP and symptoms. Admit at 37 weeks gestation.
- If the patient presents at labor and delivery with mild pre-eclampsia and a pregnancy more than 37 weeks, draw all laboratory examinations and admit her. If the cervix is favorable (Bishop ≥ 6), induce labor. If not, re-evaluate the cervix weekly and evaluate fetal well-being twice weekly. Induce labor when the cervix is favorable, or if her condition worsens, or at 40 weeks gestation. Cesarean section for obstetrical indications.
- Begin inductions at 6:00 am, following protocol for the induction of labor.
- If the induction fails, repeat it in 24 hours. The patient may eat upon terminating the failed induction.
- If the second induction fails, perform a cesarian section the following day in order to take advantage of the availability of epidural anesthesia. If there is another obstetric indication for performing the cesarian prior to this, obviously it should be heeded.

Patients in labor:

- Draw all laboratory examinations and allow labor to progress if pregnancy is more than 34 weeks.
- If the patient is stable, inhibit labor with steroids until 34 weeks gestation in order to induce pulmonary maturity (see above). Do not use tocolytics for more than 48 hours and do not repeat their use.

WARNING: Delaying delivery in a patient with pre-eclampsia may worsen her condition. These patients must be evaluated very carefully before initiating tocolysis, and must be monitored closely while they are receiving utero inhibition. If a patient's condition worsens, stop the tocolytic medication and allow her labor to progress.

- Vaginal birth if there is no obstetrical contraindication.

Patients with fetal death in labor:

- Draw all laboratory examinations following protocols for pre-eclampsia and fetal death.
- Vaginal birth if there is no obstetrical contraindication and labor progresses satisfactorily.
- If labor does not progress satisfactorily, augment with oxytocin according to protocol. If the augmentation fails, perform a cesarian section under epidural anesthesia.

Patients with fetal death not in labor:

- Draw all laboratory examinations following protocols for pre-eclampsia and fetal death.
- Admit to labor and delivery and initiate first induction.
- If the first induction fails and the cervix is favorable, repeat the induction in 24 hours. The patient may eat upon terminating the failed induction. If the cervix is not favorable, transfer patient to the postpartum service and follow fibrinogen and coagulation factors every 48 hours for one week.
- Depending on the coagulation profile and cervical changes, initiate the second induction one week after the first induction. Always remember to support these patients emotionally in the meantime.

- If the second induction fails, induce for a third time 24 hours later using prostaglandins:
 - Place one 3 mg. tablet of prostaglandin E₂ (dinoprostone) in the posterior fornix. Keep the patient lying down for at least one hour after placement of the tablet. Repeat in 6 hours if necessary. Oxytocin may be initiated 4 hours after the placement of the last prostaglandin tablet if necessary. Never use oxytocin and prostaglandins simultaneously.
- If the third induction fails, perform a cesarian section.

MODERATE PRE-ECLAMPSIA

Diagnostic Parameters for Moderate Pre-eclampsia:

- Greater tendency to gain weight (more than 4 pounds/month).
- Diastolic blood pressure 90-100 mm Hg.
- Proteinuria of 2-5 grams/24 hours.
- Edema.

□ MANAGEMENT:

- Hospitalization.
 - NO DIURETIC USE.
 - Complete history and physical examination.
 - Admit to labor and delivery or to antepartum ward.
 - Absolute bedrest in semi-fowler or left lateral position.
 - Low sodium diet (2 grams).
 - Record vital signs including fetal heart rate every 2 hours for 6 hours; if stable, go to every 4 hours.
 - Daily weight.
 - Record input and output every 24 hours.

- **Observations:**
 - Rise in blood pressure
 - Convulsions
 - Epigastric pain
 - Headache
 - Change in conduct
 - Contractions
- **Laboratory examinations**
 - Complete blood count with differential and platelet count
 - Blood type and Rh
 - 24 hour urine for total protein
 - BUN, Creatinine
 - Uric acid
 - Blood glucose
 - Prothrombin time
 - Partial thromboplastin time
 - Coagulation time
 - Fibrinogen
 - Transaminases
 - Bilirubins
 - Urinary sediment
- **Electrocardiogram**
- **Funduscopy examination by ophthalmology**
- **Intravenous solutions according to case:**
 - Dextrose 5% with three way valve to keep vein open, depending on case.
- **Present patient to chief of service.**
- **Report changes stat.**

Patients not in labor:

- Hospitalize patient and perform all examinations. Admit to antenatal ward.
- If the patient is stable, induce labor at 38 weeks gestation.
- If the pregnancy is between 28-34 weeks gestation, hospitalize patient and administer steroids weekly until 34 completed weeks (Dexamethasone 12 mg I.M. every 12 hours for 2 doses, repeated weekly). If the patient stabilizes, she should remain in the hospital and should have her labor induced at 38 weeks gestation. If the induction fails, perform a cesarian section.

Patients in labor:

- Perform all examinations and allow to progress if pregnancy is more than 34 weeks.
- If the patient is stable, inhibit labor prior to 34 weeks gestation in order to induce pulmonary maturity with steroids (see above). Do not use tocolytics for more than 48 hours and do not repeat their use.

WARNING: Delaying delivery in a patient with pre-eclampsia may worsen her condition. These patients must be evaluated very carefully before initiating tocolysis, and must be monitored closely while they are receiving utero inhibition. If a patient's condition worsens, stop the tocolytic medication and allow her labor to progress.

- Record vital signs (including fetal heart rate) and obstetric evaluation every 15 minutes on a special sheet.
- Vaginal birth if labor progresses well. Cesarean for obstetric indications.
- If labor is irregular and there is no other contraindication, augmentation with oxytocin may be used according to protocol.
- If satisfactory progress has not been made with oxytocin augmentation (< 1cm/hour for 6 hours), perform cesarian section with epidural anesthesia.

Patients with fetal death not in labor:

- Draw all laboratory examinations following protocols for pre-eclampsia and fetal death.
- Admit to labor and delivery and initiate first induction.
- If the first induction fails, repeat the induction in 24 hours using prostaglandins:
 - Place one 3 mg. tablet of prostaglandin E₂ (dinoprostone) in the posterior fornix. Keep the patient lying down for at least one hour after placement of the tablet. Repeat in 6 hours if necessary. Oxytocin may be initiated 4 hours after the placement of the last prostaglandin tablet if necessary. Never use oxytocin and prostaglandins simultaneously.
- If the second induction fails, individualize management in consultation with the chief of service.

Patients with fetal death in labor:

- Draw all laboratory examinations following protocols for pre-eclampsia and fetal death.
- Vaginal birth if there is no obstetrical contraindication and labor progresses satisfactorily.
- If labor does not progress satisfactorily, augment with oxytocin according to protocol, waiting a maximum of 8 hours before performing a cesarian section under epidural anesthesia.

SEVERE PRE-ECLAMPSIA

Diagnostic Parameters for Severe Pre-eclampsia:

- If the patient has any of the following symptoms not attributable to another cause (except edema alone), she is classified as a severe pre-eclamptic:
 - Diastolic blood pressure above 100 mm Hg.
 - Proteinuria greater than 5 grams/24 hours.
 - Edema.
 - Oliguria (≤ 500 ml/24 hours).
 - Central nervous system symptoms.
 - Thrombocytopenia.
 - Epigastric pain/liver tenderness.

MANAGEMENT:

- NO DIURETIC USE.
- Complete history and physical examination.
- Admit to labor and delivery ward.
- Absolute bedrest in semi-fowler or left lateral positions.
- Diet: nothing by mouth.
- Record vital signs including fetal heart rate hourly.
- Foley's catheter.
- Record intake and output hourly.
- Place central venous line and record central venous pressure hourly.
- Observations:
 - Rise in blood pressure
 - Convulsions
 - Epigastric pain
 - Headache
 - Change in conduct
 - Contractions

- **Laboratory examinations:**
 - Complete blood count with differential and platelet count
 - Blood type and Rh
 - 24 hour urine for total protein
 - BUN, Creatinine
 - Uric acid
 - Blood glucose
 - Prothrombin time
 - Partial thromboplastin time
 - Bleeding time
 - Coagulation time
 - Fibrinogen
 - Transaminases
 - Bilirubins
 - Urinary sediment
- **Electrocardiogram**
- **Chest X-ray**
- **Funduscopy examination by ophthalmology**
- **Medication:**
 - Apresoline (Hydralazine) 5 mg I.V. Increase dose to 10 mg, 15 mg, or 20 mg every 15 minutes if a drop in blood pressure is not seen.
 - Magnesium sulfate 4 grams in 250 ml Dextrose 5%, I.V. over 20 minutes. Follow this with a maintenance dose of 10 grams magnesium sulfate in 500 ml Dextrose 5% at 33 drops/minute (2 grams/hour).
 - Magnesium sulfate should continue for 24 hours postpartum. Monitor vital signs, urinary output and reflexes closely. In case of intoxication, utilize calcium gluconate 10 ml of a 10% solution I.V. over 3 minutes.
 - Diazepam 10 mg I.V. single dose if patient convulses (stops convulsion).
- **In case of continuous convulsions, consult with anesthetist for intubation and assisted respiration. Perform cesarian section if delivery is not imminent.**
- **Solutions: Intravenous fluids should be ideally managed at 120 ml/hour (40 drops/minute) of Lactated Ringers. If oxytocin is used, a concentrated solution in Dextrose 5% is preferable.**
- **Present the patient to chief of service.**

- Report any changes immediately.

Patients not in labor:

- Perform all examinations.
- If the patient stabilizes, deliver the baby vaginally if there is no other obstetric contraindication.
- If the patient does not stabilize within 4 hours, perform a cesarian section.

Patients in labor:

- Perform all examinations.
- Perform cesarian section in 4 hours maximum if labor does not progress well or if the patient continues to be unstable. Epidural anesthesia is preferred.
- If the patient is admitted with complete dilation, deliver vaginally applying prophylactic forceps in the second stage.

Patients with fetal death not in labor:

- Perform all examinations according to protocols for pre-eclampsia and fetal death.
- Stabilize the patient and induce her labor. If the induction fails, perform cesarian section.
- If the patient does not stabilize within 4 hours, perform cesarian section.

Patients with fetal death in labor:

- Perform all examinations according to protocols for pre-eclampsia and fetal death.
- Stabilize the patient.
- If labor is not progressing well, perform cesarian section within 4-6 hours.
- If labor is irregular, augment with oxytocin.
- If the patient is admitted with complete dilation, deliver vaginally if there is no obstetric contraindication.
- Apply prophylactic forceps in the second stage.

ECLAMPSIA:

Diagnostic parameters for eclampsia:

- A patient with pre-eclampsia who has a convulsion, without another explanation for said convulsion (i.e., history of seizure disorder), is eclamptic.

□ MANAGEMENT:

- NO DIURETIC USE.
- Complete history and physical examination.
- Admit to labor and delivery.
- Patient in separate room with intensive care
- Absolute bedrest in semi-fowler or left lateral positions.
- Diet: nothing by mouth.
- Three catheters:
 - Central line with central venous pressure recorded every hour.
 - Bladder catheter.
 - Nasogastric tube.
- Record vital signs every 30 minutes:
 - Blood pressure, pulse, respirations, fetal heart rate.
 - Record rectal temperature every 4 hours.
- Record intake and output hourly.
- Observations:
 - Rise in blood pressure
 - Convulsions
 - Epigastric pain
 - Headache
 - Change in conduct
 - Contractions

- **Laboratory examinations**
 - Complete blood count with differential and platelet count
 - Blood type and Rh
 - 24 hour urine for total protein
 - BUN, Creatinine
 - Uric acid
 - Blood glucose
 - Prothrombin time
 - Partial thromboplastin time
 - Bleeding time
 - Coagulation time
 - Fibrinogen
 - Transaminases
 - Bilirubins
 - Urinary sediment
- **Electrocardiogram**
- **Chest X-ray**
- **Funduscopy examination by ophthalmology**
- **Medication:**
 - Hydralazine (Apresoline) 5 mg I.V. Increase dose to 10 mg, 15 mg, or 20 mg every 15 minutes if a drop in blood pressure is not seen,
-OR-
 - Nifedipine 5 mg sublingual. Evaluate every 15 minutes and repeat the dose if necessary. Strict monitoring of blood pressure and fetal heart rate.
 - Diazepam (Valium) 10 mg I.V. during a convulsion.
 - Magnesium sulfate 4 grams in 250 ml Dextrose 5%, I.V. over 20 minutes. Follow this with a maintenance dose of 10 grams magnesium sulfate in 500 ml Dextrose 5% at 33 drops/minute (2 grams/hour),
-OR-
 - Phenytoin (Epamin) 250 mg I.V. stat, then every 6 hours.

NOTE: Magnesium sulfate (or phenytoin) should continue for 24 hours postpartum. Monitor vital signs, urinary output and reflexes closely. In case of magnesium intoxication, utilize calcium gluconate 10 ml of a 10% solution I.V. over 3 minutes.

- In case of continuous convulsions, consult with anesthetist for intubation and assisted respiration. Perform cesarian section if delivery is not imminent.
- Intravenous fluids should be ideally managed at 120 ml/hour (40 drops/minute) of Lactated Ringers. If oxytocin is used, a concentrated solution in Dextrose 5% is preferable.
- Present patient to chief of service.
- Report any changes stat.

Patients not in labor:

- Perform all examinations, according to protocol.
- Try to stabilize the patient. If she stabilizes and there is no obstetric contraindication, induce labor with oxytocin. If the induction fails, perform a cesarian section.
- If the patient continues convulsing in spite of treatment, perform a cesarian section immediately under general anesthesia.

Patients in labor:

- Perform all examinations, according to protocol.
- If the patient stabilizes and labor progresses well, deliver vaginally. If she stabilizes but labor does not progress well, carefully augment labor with oxytocin.
- If the patient continues convulsing, perform a cesarian section immediately under general anesthesia.
- If the patient is admitted with complete dilation, deliver vaginally if there is no obstetric contraindication.
- Apply prophylactic forceps in the second stage.

Patients with fetal death not in labor:

- Perform all examinations according to protocols for eclampsia and fetal death.
- Stabilize the patient and induce her labor. If the induction fails, perform cesarian section.
- Apply prophylactic forceps in the second stage if there is no obstetrical contraindication.
- If the patient continues convulsing 2 hours after the initiation of treatment, or in the case of status epilepticus prior to 2 hours, perform a cesarian section immediately under general anesthesia.

Patients with fetal death in labor:

- Perform all examinations according to protocols for eclampsia and fetal death.
- Stabilize the patient. If labor is not progressing well, augment with oxytocin.
- If the patient is admitted with complete dilation, deliver vaginally if there is no obstetric contraindication.
- Apply prophylactic forceps in the second stage if there is no obstetrical contraindication.
- If the patient continues convulsing 2 hours after the initiation of treatment, or in the case of status epilepticus prior to 2 hours, perform a cesarian section immediately under general anesthesia.

4. DIABETES IN PREGNANCY

DEFINITION:

- Carbohydrate intolerance provoked by pregnancy (gestational diabetes) or a pregnancy in a patient who has diabetes previously diagnosed.

RISK FACTORS:

- Family history of diabetes, previous gestational diabetes, history of unexplained fetal death, previous baby more than 8 1/2 pounds at birth.

PRINCIPAL CLINICAL SIGNS:

- Fetal macrosomia, polyhydramnios, glycosuria, polydipsia, polyphagia, polyuria, weight loss, repetitive infections in pregnancy.

LABORATORY EXAMINATIONS:

- Urinalysis
- Fasting blood glucose (normal \leq 110 mg/dl) and 1 hour postprandial glucose (normal \leq 130 mg/dl)
- Three hour glucose tolerance test
 - (normal fasting < 110 mg/dl
 - 1 hour < 190 mg/dl
 - 2 hour < 165 mg/dl
 - 3 hour < 145 mg/dl)
- Ultrasound

□ **MANAGEMENT:**

- Admit patient to hospital when glucose intolerance is detected. Effect metabolic control, therapeutic adjustments, patient education and motivation.

Hospital Conduct (pre-labor)

- Maintain diet for two days. Check blood glucose on third day (fasting and 2 hours postprandial). Acceptable levels are: fasting \leq 110 mg/dl, 2 hour \leq 130 mg/dl.
- If blood glucose is abnormal (high), start 10 units of NPH insulin, subcutaneous, every morning. Follow blood glucose and adjust dose as necessary in consultation with the department of medicine.
- Treat urine glucose and ketones as follows:

<u>Glucose</u>	<u>Ketones</u>	<u>Treatment</u>
(+)	(-)	-----
(++)	(-)	-----
(+++)	(-)	5 U Reg insulin SQ
(++++)	(-)	10 U Reg insulin SQ
(-)	(-)	-----
(without symptoms of hypoglycemia)		
(-)	(-)	Obtain blood glucose
(with symptoms of hypoglycemia) Give sugar or D50%		
(-)	(+)	Give 1 or 2 glasses of milk with sugar
(++++)	(+)	Control ketoacidosis

- **Control of Ketoacidosis**
 - Hydration: Physiologic saline 1000 ml over one hour, then 500 ml/hr until glycosuria = (+ +) or blood glucose = 250 mg/dl. After glucose levels have fallen, change to mixed intravenous solution at 500 ml/hr.
 - Insulin: 5 units regular insulin IM every hour (in severe cases use 10 units IM. Use IV if there is hypotension present). Continue these doses until ketonuria clears.
 - Laboratory examinations: Check urine glucose and ketones every hour. Blood glucose, sodium, potassium every 4 hours.

□ OUTPATIENT MANAGEMENT:

- **DIET** -- 30 to 40 kcal/kg ideal weight (see Appendix 1).
 - 25% protein, 45% carbohydrates (not rapid absorption), 20% fat.
 - Divide food into six meals daily, the last meal at 23:00.
- **METABOLIC CONTROL**
 - Fasting glucose plus 2 hour postprandial glucose after breakfast, lunch and dinner.
 - Fasting blood glucose up to 110 mg/dl is acceptable.
 - Postprandial glucose up to 150 mg/dl is acceptable.
 - If diet alone controls the blood glucose:
 - clinic visits every 2-3 weeks with blood glucose checks (fasting and 2 hour postprandial).
 - If blood glucose are above acceptable levels, **HOSPITALIZE PATIENT**.
- **Laboratory examinations:** At first visit and every 3 months
 - Urinalysis and urine culture
 - Creatinine, blood urea nitrogen
 - Proteinuria
 - Fundoscopic examination
 - Glycosylated hemoglobin (HbA1C) - levels should be less than 9%.

□ OBSTETRIC MANAGEMENT:

- Clinical evaluation by departments of obstetrics and medicine.
- Evaluation of fetal well-being weekly after the 32nd week.
Ultrasound every 4 weeks beginning at 28 weeks investigating:
 - Fetal weight
 - Fetal growth
 - Subcutaneous tissue
 - Presence of anomalies
 - Amniotic fluid volume
 - Placenta: size and grade
- Hospitalization after the 34th week. Discharge after delivery.

- **In premature labor:**
 - See protocol for premature labor.
 - Betamimetics should only be given to hospitalized, metabolically controlled patients. Blood glucose should be monitored frequently. Betamimetics can cause hyperglycemia and ketoacidosis in diabetic patients.
 - Indomethacin is preferred in patients with uncontrolled diabetes.
 - Corticosteroids may be used in hospitalized, well compensated patients, with close monitoring of their metabolic state.

- **Management of labor:**
 - Fetus healthy - spontaneous delivery at term.
 - Mature fetus with compromised health - deliver.
 - Immature fetus with compromised health - induce pulmonary maturity and deliver.
 - Pregnancy at 37 weeks and above with evidence of fetal macrosomia - deliver.
 - There is no contraindication to the use of oxytocin.

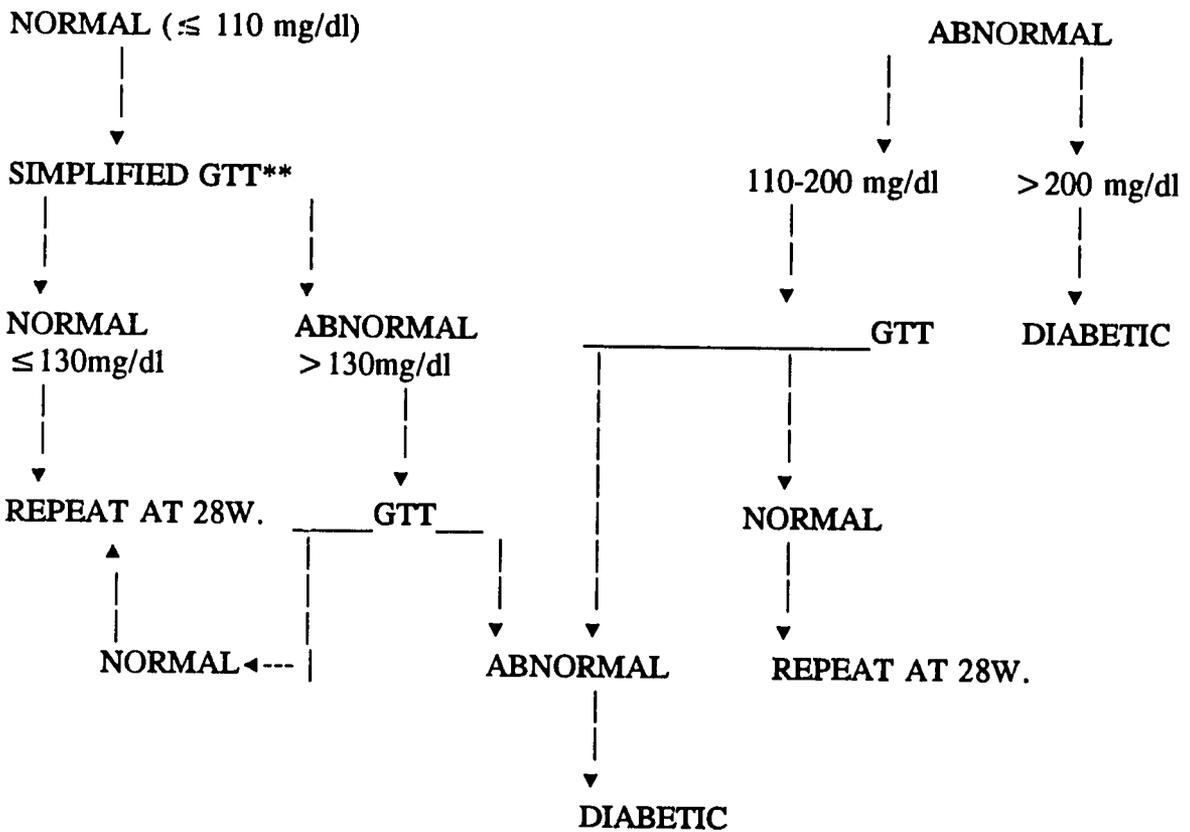
- **Diabetic control during labor and delivery:**
 - Stop NPH insulin.
 - Intravenous solution 5% dextrose, offering 150-200 grams in 24 hours.
 - Administer regular insulin subcutaneously every 4 hours as follows:

<u>Glucose</u>	<u>Ketones</u>	<u>Treatment</u>
(-)	(-)	D50% 20 ml IV + 5 U Reg insulin SQ + obtain blood glucose
(+)	(-)	Reg insulin 5 U SQ
(++)	(-)	Reg insulin 5 U SQ
(+++,++++)	(-)	Reg insulin 10 U SQ
(-)	(+)	D50% 40 ml IV + Reg insulin 5 U SQ
(++++)	(+)	Control ketoacidosis

- **Diabetic control after delivery:**
 - **Patients with gestational diabetes: maintain diet and manage blood glucose according to prenatal chart using urinary glucose and ketones.**
 - **Patients with non gestational diabetes: maintain fixed dosage of regular insulin the first day postpartum as follows:**
 - 5 U SQ before breakfast
 - 10 U SQ before lunch
 - 10 U SQ before dinner
 - 5 U SQ with snack at 23:00 hours
 - **Second day postpartum: Diabetic diet**
 - NPH insulin 2/3 of pre-pregnancy dose before breakfast
 - Control urinary glucose/ketones
 - Refer to endocrinologist or department of medicine.

PATIENT WITH POTENTIAL FOR GLUCOSE INTOLERANCE*

FASTING BLOOD GLUCOSE



* See risk factors.

GTT = Glucose Tolerance Test

** 50 grams glucose p.o., blood glucose one hour post ingestion

5. LABOR MANAGEMENT

A. STANDARD ADMISSION ORDERS FOR THE LABOR WARD

Admit to labor ward, request and review prenatal chart, and take the history of the present labor.

Diet:

- Clear fluids.

Activity:

- Ambulatory if membranes are intact or with ruptured membranes if the presentation is well engaged.
- Bedrest if membranes are ruptured and the presenting part is not well engaged.

Observations:

- General condition of woman
 - Psychological attitude, hydration, hemorrhage, hydorrhea, nausea, vomiting.
- Vital signs:
 - Chart hourly on graphic form (heart rate, blood pressure, respirations, temperature).
 - Urinary output: (encourage the woman to pass urine every 2 hours; measure output and record)
- Fetal condition:
 - Strict monitoring and recording of fetal heart rate before, during and after a contraction every 15 minutes.
 - Observation of color of liquid.

- **Progress of labor:**
 - Timing and recording of uterine contractions every 15 minutes.
 - Descent of presenting part.
 - Cervical dilation.
 - **Complete partograph for every patient in labor.**

Laboratory examinations:

- Hemoglobin, hematocrit, blood type and Rh, urinalysis, VDRL if no recent laboratory examinations available. (Obtain minimum laboratory examinations and others necessary according to case).

Medication:

- Evaluate according to case.

Decide on a management plan for the patient.

Always present the woman to attending chief and/or service or on-call resident.

Record and report all abnormal changes immediately, however minimal.

B. NORMAL CEPHALIC PRESENTATION

DEFINITION:

- Labor and delivery with one fetus, at term (≥ 37 weeks) in the cephalic, vertex position, without evidence of other obstetric or medical problem (cephalopelvic disproportion, placenta previa, maternal or fetal cardiac disease etc.)
- Definition of labor: Regular uterine contractions that produce cervical effacement and dilation and/or the descent of the presenting fetal part.

LABORATORY EXAMINATIONS:

- According to standard admission orders.

MANAGEMENT:

- Make the diagnosis of labor. If the diagnosis is not firm, if the patient lives far from the hospital or if it is night time, the patient may be invited to stay in the hospital for 12 hours of observation.
- Complete physical and abdominal examination. Vaginal examination by a resident.
- Admit patient to labor ward. Reassure the woman and explain all procedures to her. Keep the family informed of progress.
- Maternal condition:
 - Monitor and record vital signs every hour (blood pressure, pulse, respirations).
 - Monitor hydration, psychological attitude and reaction to pain.
 - Encourage the woman to pass urine every 2 hours.
 - Record intake and output every 2 hours.

- **Fetal condition:**
 - Monitor and record fetal heart rate before, during and after a contraction every 15 minutes.
 - Evaluation of fetal well-being - abnormalities in the fetal heart rate (Type II decelerations or marked variable decelerations, bradycardia).
 - Observe the color of the amniotic fluid

- **Progress of labor**
 - Monitor and record uterine activity every 15 minutes. Contractions should increase in frequency, length, and strength.
 - Vaginal examination every two hours* (if there is no other indication) under strict conditions of asepsis and hygiene. Assessment should include: the consistency, effacement and dilation of the cervix; the descent, caput, moulding and degree of flexion of the cephalic presentation; evidence of cephalo-pelvic disproportion; the state of the membranes and the color of the amniotic fluid. After the third examination, further examinations are to be at the discretion of the resident. The findings of each examination and the exact number of examinations must be recorded. The total number of examinations should never be more than eight.
 - Partograph for every patient. If labor does not progress well according to the partogram criteria, consult the resident or attending obstetrician about oxytocin augmentation. Normal progress is a minimum of 1 cm/hour cervical dilation.
 - Amniotomy at 4 cm dilation (or more) in every patient with the fetal head at station -2 and below. If the fetal head is mobile or above -2 station at 4 cm cervical dilation, consult the attending obstetrician or the third year resident for a needle amniotomy.

- All abnormalities in vital signs, fetal heart rate, progress in labor or vaginal bleeding must be communicated immediately to the third year resident.

* Vaginal examinations every two hours are routine in Hospital General de Occidente San Juan de Dios. WHO Guidelines recommend vaginal examinations every four hours. (WHO 1988)

IMPORTANT CONSIDERATIONS:

Always respect the modesty of all patients. Keep them covered during examinations and while being transferred from one room to another. Always speak to them with respect and dignity.

The ideal position for the expulsive phase (when the woman is pushing) is sitting or squatting, to take advantage of gravity.

The duration of actual labor is defined as the number of hours a woman is in the labor ward, from the time she is admitted with a diagnosis of labor to the time she gives birth. In the great majority of cases this should not be more than 12 hours.

The maximum number of personnel in the delivery room is six (and preferably fewer than six).

Episiotomy according to the case and the experience of the obstetrician.

A resident must be present at every delivery. Normal delivery - R1. Complicated delivery - R2 or R3.

A resident must be present for the suturing of all episiotomies and/or lacerations.

The mother must be given the opportunity to hold her baby and initiate breastfeeding immediately (if her medical condition permits it) before the baby is taken to the neonatal ward.

PROGRESS OF LABOR

NORMAL PROGRESS IN LABOR --> *YES* --> *ALLOW TO PROGRESS*
(1 CM/HR DILATION)

--> *NO*

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▼

EVALUATE MATERNAL AND FETAL CONDITION, PROGRESS OF LABOR, PELVIC CAPACITY, AND DECIDE ON USE OF OXYTOCIN AUGMENTATION.

DURATION OF LABOR < 12 HOURS --> *YES* --> *ANTICIPATE NORMAL DELIVERY* (However, $\pm 15\%$ of women may need a cesarean section or forceps delivery)

--> *NO*

|

▼

RE-ASSESS PATIENT AND REVISE MANAGEMENT PLAN

C. BREECH PRESENTATION

DEFINITION:

- Labor and delivery with a fetus in the breech position.

DIAGNOSTIC EXAMINATION:

- Ultrasound
- Plain abdominal X-ray

MANAGEMENT:

- Patient in labor, with or without prenatal care:
 - Admit to labor and delivery.
 - Evaluation by 3rd year obstetrics resident or by chief of service.
 - Estimate gestational age by fundal height/last menstrual period or ultrasound. Pregnancies less than 36 weeks pass to Protocol for Premature Labor with or without ruptured membranes, always remembering the high risk of cord prolapse in a breech pregnancy with ruptured membranes.
 - Evaluation of fetal well-being - abnormalities in the fetal heart rate (Type II decelerations or marked variable decelerations, bradycardia).
 - Ultrasound to estimate fetal weight, rule out congenital anomalies and assess fetal head flexion/extension.
 - If an ultrasound examination is not possible, a plain abdominal X-ray is obligatory.
 - Maternal pelvimetry

The following are the minimum acceptable maternal pelvic measurements:

	PA (cm)	Transverse (cm)
Pelvic inlet	11.5	12.5
Mid-pelvis	11.5	9.5 (interspinous)

- If there are signs of fetal compromise or cord compression, perform an emergency cesarian section, omitting the ultrasound or X-ray examination.
- Labor and vaginal birth of a fetus in the breech position is permitted if the following conditions are met:
 - Estimated fetal weight between 2550 - 3800 grams, or fetus at term and clinically of average size.
 - Frank or complete breech.
 - Flexion of fetal head is confirmed.
 - Pelvic dimensions are adequate, either clinically or by X-ray pelvimetry.
- Fetuses with major congenital anomalies incompatible with life (e.g., anencephaly) should be allowed to deliver vaginally.
- Contraindications to a vaginal breech birth:
 - Estimated fetal weight greater than 1000 grams but less than 2500 grams, or greater than 3800 grams; fetus clinically macrosomic; gestational age greater than 30 weeks but less than 37 weeks.
 - Abnormal maternal pelvis; non gynecoid, inlet or mid-pelvis less than average.
 - Extension of fetal head.
 - Incomplete breech, or umbilical cord prolapse.
 - Abnormalities in the fetal heart rate.
- Conditions that do not contraindicate a vaginal breech birth, but that require consultation and evaluation by the chief of service:
 - Breech presentation in primigravida.
 - Previous cesarian section.
- Conditions that require immediate cesarian section:
 - Significant abnormality of fetal heart rate.
 - Abnormal labor:
 - Dysfunctional contractions
 - Prolonged active phase
 - Lack of descent in active phase
 - Prolonged second stage:
 - More than 1 hour in primigravidae and 1/2 hour in multiparae.
 - Cord prolapse.

- Attending a vaginal breech birth:
 - Monitor vital signs, fetal heart rate and uterine contractions as described for a cephalic birth.
 - Keep membranes intact as long as possible.
 - Normal partograph (labor curve).
 - Avoid the use of oxytocin in general: if its use is considered, the chief on call must be consulted.
 - Have the woman push sitting or squatting at the indicated moment, when the baby's buttocks are distending the perineum.
 - Perform ample mediolateral episiotomy.
 - Residents or chiefs required at a breech birth: 2 obstetricians, 1 anesthesiologist, 1 pediatrician.

- Attending a cesarian breech birth:
 - Epidural anesthesia.
 - Choose type of uterine incision according to gestational age, fetal weight, fetal position, surgeon's ability, signs of fetal compromise.

NOTE: Wherever possible, a transverse incision in the lower segment should be the incision of choice. An upper segment cesarian section should be avoided but may be necessary in extreme prematurity or extreme vascularity because of placenta previa.

- Breech birth in patient presenting with advanced dilatation:
 - Incomplete dilation with signs of fetal compromise --► emergency cesarian section.
 - Incomplete or complete dilation without signs of fetal compromise --► take plain abdominal X-ray. Route of delivery according to X-ray findings.
 - Incomplete or complete dilation, feet or fetal parts in the vagina, no signs of fetal compromise --► take plain abdominal x-ray. Route of delivery according to X-ray findings.
 - Incomplete or complete dilation, with or without fetal parts in the vagina, complementary studies not possible --► perform emergency cesarian section.

D. TRANSVERSE LIE

DEFINITION:

- The fetus lies with its long axis across the long axis of the uterus.

MANAGEMENT:

"Fixed" or persistent transverse lie:

- The safest treatment is delivery by cesarean section at or near term or immediately when the woman presents in labor.

"Unstable" lie:

- When the baby's position keeps changing until term and the presentation is cephalic in labor, vaginal delivery may be possible, but:
 - rule out:
 - placenta previa
 - contraction of the pelvis
 - pelvic tumor
 - perform rupture of the membranes with precautions:
 - ask someone else to push the head into the brim abdominally
 - let the liquor run out slowly
 - check for cord prolapse
 - check the fetal heart
 - if the head enters the pelvis, observe the progress of labor carefully.
 - if the head does not enter the pelvis, do a cesarean section.

E. TWINS

DEFINITION:

- Labor and delivery of two fetuses from the same pregnancy.

☐ **LABORATORY EXAMINATIONS:**

- Ultrasound
- Plain abdominal X-ray

☐ **MANAGEMENT:**

- Preterm labor:
 - Tocolysis according to protocol for preterm labor.
 - If there are doubts about the gestational age, amniocentesis to determine fetal lung maturity. If fetal lung maturity is demonstrated, effect delivery.
- Route of delivery:
 - Both fetuses in cephalic presentation --► vaginal birth. Cesarean section for obstetric indications.
 - First twin cephalic, second twin breech --► vaginal birth if 2nd twin's head is well flexed and its weight is >2500 grams but <3800 grams. Cesarean section for obstetric indications.
 - Other variants --► cesarian section.

NOTE: Minimum personnel required for a vaginal twin birth are 2 obstetricians (a 3rd year resident or chief, plus one more), 2 pediatricians and 1 anesthesiologist.

External and internal version of the second twin and complete pelvic extraction may be performed if the following resources are available: ultrasound in the delivery room, fetal monitor, obstetric operating room, and equipment for managing a compromised newborn.

- Use of oxytocin:
 - Induction and augmentation according to protocol.
 - Second twin:
 - Check the lie.
 - Make sure it is longitudinal.
 - If labor does not begin again within 10 minutes after the birth of the first twin, begin oxytocin augmentation and perform artificial rupture of membranes (ARM).
- Cesarean section for second twin:

- Indications are the same as a singleton pregnancy.

After delivery of the second twin and the placenta(s):

- Ergotrate 0.2 mg I.M.
- Oxytocin 20 IU in 500 ml of 5% Dextrose or Ringers at 40 drops/minute.
- Monitor for postpartum hemorrhage.

Important Considerations:

Never drain blood from the first twin's cord before the birth of the second twin. Twin-twin anastomoses can exist in the placenta, and the second twin can exsanguinate by this action.

The overdistended uterus may react very mildly to oxytocin before rupturing. Be **VERY CAREFUL** with the use of oxytocin in twin pregnancies.

Always be ready to manage a postpartum hemorrhage in a twin pregnancy. Be sure that the necessary medications are in the delivery room before attending the birth.

The route of delivery of monoamniotic twins is an elective cesarian section at 36 weeks gestation or as early as pulmonary maturity can be demonstrated.

F. FORCEPS DELIVERY

If forceps delivery is necessary, application of the forceps must be directly supervised by the chief of service or a third year resident.

Only low or outlet forceps should be used. Mid-cavity forceps should never be applied.

Low or outlet forceps is understood to be forceps applied when the fetal head has reached the pelvic floor, is visible without separating the labia, and has the sagittal suture in the antero-posterior position in the pelvis.

Requirements for the application of forceps:

- Bladder and rectum empty
- Complete dilation of cervix
- Membranes ruptured
- Exact position of fetal head known
- Adequate anesthesia
- Generous episiotomy
- Intravenous fluids with No. 18 angiocath
- One pediatrician present

The indications for the application of forceps must be clearly recorded in the patient's chart.

6. INDUCTION AND AUGMENTATION OF LABOR

A. INDUCTION

DEFINITION:

- The use of physical and pharmacological agents to initiate and maintain labor.

INDICATIONS:

- The presence of medical or obstetrical problems that necessitate the interruption of the pregnancy before the beginning of spontaneous labor.

EXAMPLES:

- Hypertensive disease in pregnancy
- Diabetes mellitus
- Rh iso-immunization

REQUIREMENTS:

- Cephalic presentation
- Single fetus
- Bishop score more than 6 for an elective induction
- No sign of fetal distress
- Strict monitoring by obstetric resident

CONTRAINDICATIONS:

- Absolute:
 - Acute fetal distress
 - Fetal malpresentation
 - Unexplained vaginal bleeding
 - Fetal hydrocephaly
 - Marked pelvic deformity
 - Upper segment uterine scar (cesarian, myomectomy)

- Two previous lower segment cesarian sections
- **Relative:**
 - Multiple pregnancy
 - Polyhydramnios
 - Grand multipara
 - One previous lower segment cesarian section

□ **PROCEDURE:**

- Begin elective inductions at 6:00 am.
- Monitor maternal and fetal vital signs according to protocol for the management of labor and delivery.
- Place No. 18 angiocath.
- Begin I.V. solutions: Hartmann's (Ringer's lactate), Dextrose or Mixed.
- Oxytocin (Syntocinon) 1 ampule (5 IU) in 500 ml. Begin at 5 drops/minute (2.5 mIU/min). Increase by 5 drops (2.5 mIU) every 30 minutes until there are 3 contractions lasting 40-50 seconds in 10 minutes or one contraction every 3 minutes, or to a maximum of 60 drops (30 mIU).
- Someone must remain at the patient's bedside constantly monitoring uterine activity. This person may be an intern, extern or resident. The resident must evaluate the patient at least every 30 minutes, and only the resident can increase the dose of oxytocin.
- Partograph (labor curve) is obligatory.
- Early amniotomy according to case. Consult with chief on call or 3rd year resident before performing amniotomy.
- A failed induction is when there has been no cervical change or descent of the presenting part after 6-8 hours of labor, or if one never achieves 3 contractions in 10 minutes or 1 contraction every 3 minutes.

B. AUGMENTATION

DEFINITION:

- The use of pharmacological agents to augment the frequency or intensity of existing uterine contractions in a patient in labor.

INDICATION:

- Poor progression of labor according to the partograph (< 1 cm/hour cervical dilation).

CONDITIONS:

- Cephalic presentation
- Single fetus
- No signs of fetal distress
- Strict monitoring by obstetric resident

CONTRAINDICATIONS:

- **Absolute:**
 - Acute fetal distress
 - Fetal malpresentation
 - Unexplained vaginal bleeding
 - Fetal hydrocephaly
 - Marked pelvic deformity
 - Previous uterine scar (cesarian, myomectomy)
 - Two previous lower segment cesarian sections
- **Relative:**
 - Multiple pregnancy
 - Polyhydramnios
 - Grand multipara
 - One previous lower segment cesarian section

□ **PROCEDURE:**

- Monitor maternal and fetal vital signs according to protocol for the management of labor and delivery.
- After consultation with the chief on call or 3rd year resident, amniotomy should be performed at the same time as augmentation has started or as soon as possible afterwards if the procedure was difficult.
- Cervical examination one hour after amniotomy by the same person who performed the amniotomy. If there has not been progress of 1 cm/hour dilatation, begin oxytocin augmentation.
- Oxytocin (Syntocin) 1 ampule (5 IU) in 500 ml. Begin at 5 drops/minute (2.5 mIU/min). Increase by 5 drops (2.5 mIU) every 30 minutes until there are 3 contractions lasting 40-50 seconds in 10 minutes or one contraction every 3 minutes lasting 40-50 seconds, or to a maximum of 60 drops/minute (30 mIU).
- Someone must remain at the patient's bedside constantly monitoring uterine activity. This person may be an intern, extern or resident. The resident must evaluate the patient at least every 30 minutes, and only the resident can increase the dose of oxytocin.

7. VAGINAL BIRTH AFTER CESARIAN SECTION

PRENATAL PERIOD:

- Education about the risks and benefits of a vaginal birth after cesarian section.
- Iron and folic acid supplementation (encourage use via education).
- Confirm gestational age early, via an ultrasound examination if there is any doubt about the age.
- Obtain records of previous cesarian section.
- The patient must be seen by a 2nd or 3rd year resident at her first visit.

LABOR AND DELIVERY:

- Conditions for allowing a vaginal delivery:
 - Previous lower segment incision.
 - Absence of evidence of cephalo-pelvic disproportion (by clinical pelvimetry).
 - Single fetus in the cephalic presentation.
- Contraindications for a vaginal delivery:
 - Previous upper segment uterine incision.
 - Infectious complications in previous cesarian section (if the infection was a superficial skin infection and this can be proven by reviewing the records from the previous cesarian section, the patient can be allowed a trial of labor).
 - Malpresentation.
 - Pelvic deformities.
 - Previous uterine or vaginal surgery (aside from the cesarian).
 - More than one previous lower segment cesarian section (see below).

- **Patients with a previous lower segment cesarian section who present in established labor, with or without prenatal care:**
 - **Must meet the same conditions outlined in a. and b. above.**
 - **Decision to allow labor to progress must be made by a 3rd year resident or chief on call.**
 - **There is no contraindication to the use of oxytocin augmentation.**
 - **Women with more than one previous lower segment cesarian section but with advanced dilation (8 cm+) and with the fetal part engaged may be allowed to progress vaginally if there is no other contraindication.**

- **Attention at delivery:**
 - **Chief of service or resident.**
 - **Avoid fundal pressure.**
 - **Inform the operating room of a possible emergency surgery.**
 - **Check lower segment after delivery.**

8. POSTPARTUM HEMORRHAGE

DEFINITION:

- Blood loss of 500 ml or more from the reproductive tract after the birth of a baby.

RISK FACTORS:

- Previous postpartum hemorrhage, large baby, multiple pregnancy, high parity, general anesthesia, prolonged or precipitate labor, prolonged 3rd stage, maternal obesity, uterine overdistension, use of forceps, perineal incisions or tears, coagulation defects.

PRINCIPAL CLINICAL SIGNS:

- Loss of bright red blood after delivery of the placenta
- Hemorrhage like a "faucet" from vagina
- Nausea and dizziness
- Tachycardia and/or hypotension (signs of shock)

LABORATORY EXAMINATIONS:

- Hematocrit, hematology, coagulation factors.

MANAGEMENT:

- Prenatal Period:
 - Patient with history of postpartum hemorrhage:
Routine laboratory examinations
Iron and folic acid supplementation
Education plan about:
Come to hospital early in labor;
The importance of iron supplementation.

- **Labor and Delivery:**
 - Routine laboratory examinations (see Standard Orders for Admission to Labor and Delivery).
 - Patients with a history of postpartum hemorrhage should have a #18 angiocath placed.

- **Hemorrhage immediately after birth of the baby, before birth of the placenta:**
 - Place angiocath #18 if not already in place.
 - Massage uterine fundus while applying suprapubic pressure (to prevent uterine inversion).
 - Empty bladder with Foley catheter.
 - Put the baby to the breast to suck, or stimulate nipples manually.
 - Ergotrate 0.2 mg (1 ampule) I.M. stat followed by controlled cord traction to deliver the placenta.
 - If the bleeding persists without delivery of the placenta, rapidly explore the perineum, vagina and cervix looking for lacerations. Call the anesthesiologist.
 - Perform manual removal of the placenta with or without anesthesia.
 - If bleeding persists, see below.

- **Hemorrhage immediately after birth of baby and placenta:**
 - Place angiocath #18 if not already in place.
 - Ergotrate 0.2 mg (1 ampule) I.M. stat.
 - Oxytocin (Syntocin) 4 ampules (20 IU) in 500 ml of Dextrose or Mixed I.V. solution, rapid infusion rate until the uterus contracts and the hemorrhage stops.
 - Put the baby to the breast to suck, or stimulate nipples manually.
 - Massage uterine fundus while applying suprapubic pressure (to prevent uterine inversion).
 - Empty bladder with Foley catheter.
 - If the bleeding persists, rapidly explore the perineum, vagina and cervix looking for lacerations. Explore the uterine cavity for retained placental fragments. Call the anesthesiologist.
 - If there are retained placental fragments ---► gentle curettage with curette #6 or larger. If there are lacerations --► suture them immediately if they are the source of the hemorrhage (exclude uterine rupture).

- If the hemorrhage still persists:
 - call the chief, and
 - look for a blood donor and transfuse whole blood and
 - perform an emergency laparotomy.
- In the laparotomy:
 - 1st step: Open uterine massage. Inspect uterus for lacerations.
 - 2nd step: Intramyometrial oxytocin, prostaglandin or methergin as follows:
 Oxytocin 10 IU divided between the two cornuae.
 Prostaglandin F₂ 1mg divided in multiple sites.
 Prostaglandin 15 methyl 0.25mg divided in multiple sites.
 Methergin 0.2mg divided between the two cornuae.
 - 3rd step: Ligation of the uterine arteries.
 - 4th step: Ligation of the ovarian arteries at the utero-ovarian anastomosis.
 - 5th step: Ligation of the hypogastric arteries.
 - 6th step: Total or subtotal hysterectomy.

NOTE: The aorta may be compressed at the subrenal level for up to 45 minutes while other procedures are being undertaken. This can help diminish blood loss.

- Late postpartum hemorrhage:
 - Follow the same steps as in b. above.

IMPORTANT CONSIDERATIONS:

Remember that a patient can lose a large amount of blood in a very short time postpartum. You must act rapidly, and you must know what steps to follow before a postpartum hemorrhage actually occurs.

The best way to treat these patients is with a team of medical personnel, as there are many actions that must be performed simultaneously.

A laparotomy for postpartum hemorrhage need not be delayed while awaiting blood for transfusion. This is an extremely urgent situation.

9. PRETERM LABOR

A. INTACT MEMBRANES

DEFINITION:

- Labor that initiates after 20 weeks and before 37 weeks gestation.

RISK FACTORS:

- History of premature delivery, uterine anomalies, history of renal disease or pyelonephritis, multiple pregnancy, others.

PRINCIPAL CLINICAL SIGNS:

- Regular uterine contraction plus:
 - Cervical changes
 - Dilation
 - Effacement

LABORATORY EXAMINATIONS:

- See B. Standard Admission Orders

MANAGEMENT:

- Admit to labor and delivery.
- Laboratory examinations see B. Standard Admission Orders
- Begin
 - Hydration, bedrest
 - Tocolytics
 - Steroids (if gestation < 35 weeks)
 - Sedatives

- Evaluate fetus with ultrasound/ X-ray to see position, gestational age and presence of congenital anomalies.
- If tocolysis is successful (contractions and effacement/ dilation do not progress) begin oral tocolytics and transfer patient to antenatal service.

Transfer Orders:

- Transfer to antenatal ward.
- Absolute bedrest.
- Normal diet.
- Vital signs every 30 minutes for 2 hours; if normal then per routine.
- Observations:
 - Blood pressure less than 90/55 mmHg.
 - Maternal pulse greater than or equal to 120/min.
 - Hydrorrhea or vaginal bleeding
 - Uterine contractions more frequent than every 10 minutes.
- Record urinary output every 12 hours
- Transfer patient with laboratory examinations noted in record
- Ultrasound, Non-Stress Test (NST) and amniocentesis (according to case)
- Evaluation of fetal well-being a minimum of twice weekly
- Consultations according to associated problems
- Medications:
 - Fenoterol 5 mg p.o. every 6 hours -OR-
 - Isoxuprine 10 mg p.o. every 6 hours -OR-
 - Ritodrine 10 mg p.o. every 4 hours -OR-
 - Indomethacin 100 mg p.o. every 12 hours for 5 days,
PLUS
 - Phenobarbital 50 mg p.o. every 12 hours for 4 doses.
- If tocolysis is not successful after 6 hours (contractions, dilation and or

effacement continue), stop tocolytic medication and allow patient to progress. Remember to notify the neonatal service to prepare for a premature newborn.

- If contractions (> one every 15 minutes) begin again after starting oral tocolytics and there is no contraindication to the use intravenous tocolytics a second time, transfer the patient back to labor and delivery to reinstitute I.V. tocolytics. (Only one repetition of I.V. tocolysis).
- If the patient presents with cervical dilation of 3 cm or more, transfer to labor and delivery and allow her to progress with a vaginal delivery if there is not contraindication to this. The delivery should be attended by the obstetric resident, and the pediatric resident should be advised and present for the delivery. An ample episiotomy should be performed.
- If there is any contraindication to a vaginal birth and tocolysis has failed, perform a cesarian section.
- Conditions for Discharge
 - Disappearance of the signs and symptoms that motivated the admission for a minimum time period of 48 hours after tocolysis was achieved. General examination should be normal.
 - No associated pathology, or under treatment of same (eg. antibiotics)
 - Patient is to continue oral tocolysis according to directions until she has been evaluated in one week in the outpatient clinic, where she should be seen by a 2nd year obstetrics resident. Tocolytics can be discontinued and the patient should be seen weekly. If she cannot attend the hospital outpatient clinic, refer her with a referral sheet to the health center/post nearest to her home.
 - Educate patient about:
 - Monitoring uterine activity
 - Fetal movement counting
 - No sexual activity
 - Hydrorrhea
 - Vaginal bleeding
 - Decreased fetal movements
 - Important of correctly complying with medical treatment and prenatal care
 - Decreasing physical activity
 - Easy access to hospital
 - Delivery in the hospital.

B. STANDARD ADMISSION ORDERS - INTACT MEMBRANES

Admit to labor and delivery ward.

Absolute bedrest in left lateral decubitus position.

Diet: Nothing by mouth for 4 - 6 hours. Evaluate according to case.

Vital signs: record every 15 minutes - blood pressure, maternal pulse, respirations and fetal heart rate. Record oral temperature every 4 hours.

Observations:

- Psychological attitude
- Pulse greater than or equal to 120/min
- Blood pressure less than or equal to 90/55 - 100/85 mm Hg
- Uterine activity (observe for 10 minutes every 20 minutes)
- Fetal heart rate less than 120/minute or greater than 160/minute and/or variations in fetal heart rate
- Hydrorrhea
- Fetal movements
- Vaginal bleeding
- Nausea and vomiting

Laboratory examinations:

- Complete blood count
- Blood type and Rh
- Urinalysis and urine culture
- V.D.R.L.

- C-Reactive protein (depending on the patient's ability to finance this)
- Gram stain and culture of endocervical secretion
- Others (depending on associated medical problems)

Ultrasound:

- Depending on availability and patient's ability to finance this. To diagnose age, weight, congenital anomalies, presentation, placenta maturity, volume of amniotic fluid, fetal respiratory and body movements.

Non-Stress Test (NST):

- To be performed on all patients with a pregnancy above 30 weeks gestation, when possible.
- Fetal movement count in the absence of NST

Amniocentesis:

- When the obstetrician considers it necessary to demonstrate pulmonary maturity or the presence of infection.

Intravenous fluids:

- Begin a mixed I.V. solution at 120ml/hr

Medication:

- Tocolytics:

NOTE: Absolute contraindications for the use of tocolytic medications are the presence of chorioamnionitis, severe intrauterine growth retardation, fetal death, vaginal bleeding, and a congenital anomaly incompatible with life.

- **Isoxuprine chlorhydrate:** 100 mg (10 ampules) in 500 ml 5% Dextrose. Begin at 10 drops per minute, and increase the dose by 5 drops every 15 minutes until uterine activity ceases or to a maximum dose of 50 drops/minute. Monitor maternal blood pressure and pulse and fetal heart rate closely. Decrease or stop the infusion if the maternal pulse becomes greater than 120/minute, maternal blood pressure becomes less than 90/55 mm Hg., or the fetal heart rate becomes greater than 160/minute.
- OR-
- **Fenoterol:**
 - 1 to 2 mcg/ minute I.V in 5% Dextrose solution as follows:
 - Put two 0.5 mg ampules of fenoterol (Partusisten) into 500 ml 5% Dextrose solution. Begin infusion at 5 drops/15 microdrops per minute and increase by 5 drops/15 microdrops every 30 minutes until uterine activity ceases or to a maximum dose of 15 drops/45 microdrops per minute. Decrease or stop the infusion if the maternal pulse becomes greater than 120/minute, maternal blood pressure becomes less than 90/55 mm Hg., or the fetal heart rate becomes greater than 160/minute.
- OR-
- **Ritodrine:**
 - Put 50 mg in 500 ml 5% Dextrose solution. Begin infusion at 10 drops/minute (0.05 mg/min) and increase by 10 drops (0.05 mg/min) every 15 minutes until uterine activity ceases or to a maximum dose of 70 drops/min (0.35 mg/min). Decrease or stop the infusion if the maternal pulse becomes greater than 120/minute, maternal blood pressure becomes less than 90/55 mm Hg., or the fetal heart rate becomes greater than 160/minute.
- OR-
- **Magnesium sulfate:**
 - Use magnesium sulfate in patients who have absolute medical contraindications to the use of betamimetics (diabetes, hyperthyroidism, cardiac disease).
 - * Initial dose: 4 grams magnesium sulfate in 250 ml 5% Dextrose solution. Infuse I.V. over 30 minutes.
 - * Maintenance dose: 10 grams magnesium sulfate in 500 ml 5% Dextrose solution. Begin infusion at 16 drops/minute (1 gm/hour). Increase to 33 drops/minute (2 gm/hour) in one hour if uterine activity continues.

NOTE: Monitor patient for hyporeflexia, double vision respiratory difficulties, and urinary output of less than 1ml/kg/hour. In case of magnesium intoxication, use calcium gluconate (10 mg of a 10% solution, given I.V. over 3 minutes).

-OR-

- Indomethacin: 100 mg suppository per rectum every 12 hours for 48 hours, then 100 mg p.o. every 12 hours for 5 days.

After uterine activity has decreased significantly for a minimum period of 8 hours, begin oral tocolysis one hour before discontinuing intravenous tocolysis.

- Sedatives:
 - Phenobarbital 100 mg I.M. stat and then every 12 hours for 4 doses or until the patient is transferred off labor and delivery (maximum of 4 doses).
- Steroids (only in pregnancies less than 35 weeks):
 - Dexamethasone 12 mg I.M. every 12 hours for two doses. In pregnancies between 28 and 34 weeks gestation, repeat the dose weekly until 34 completed weeks.

C. RUPTURED MEMBRANES

DEFINITION:

- Labor with ruptured membranes after 20 weeks and before 37 weeks of gestation.

RISK FACTORS:

- History of premature delivery, multiple pregnancy, cervical surgery, polyhydramnios, infection.

PRINCIPAL CLINICAL SIGNS:

- Regular uterine contraction plus:
- Cervical changes
 - Dilation
 - Effacement
- Loss of clear, milky, yellow or brown fluid from the vagina. The patient complains of wetness, and more fluid may come out with physical activity.

LABORATORY EXAMINATIONS:

- "Ferning" or arborization of liquid on microscope slide, Papanicolaou of cervical secretion (presumed amniotic fluid), test with Nitrazine paper.

MANAGEMENT:

- Hospitalization in labor and delivery.
- Laboratory examinations (see D. Standard Admission Orders)

28 - 34 Weeks:

- Single examination with sterile speculum by resident.
- Ultrasound examination if possible.
- Abdominal X-ray if presentation is in doubt.

- **Tocolytics:** Follow protocol for premature labor with intact membranes. This is to allow the induction of pulmonary maturity with steroids in pregnancies less than 35 weeks gestation. If tocolysis is not successful within 6 hours, stop the tocolytic medication and allow labor to progress. Tocolytic treatment should be continued only for 24 hours after the last dose of steroids.

NOTE: Inhibition of uterine contractions is contraindicated in the presence of signs of uterine infection, congenital anomalies and cervical dilation > 3 cm.

- **Dexamethasone:** 12 mg I.M. every 12 hours for two doses in pregnancies less than 35 weeks gestation. Repeat dose weekly until 35 weeks.
- Record oral temperature every 4 hours.
- Consult other departments for associated problems.

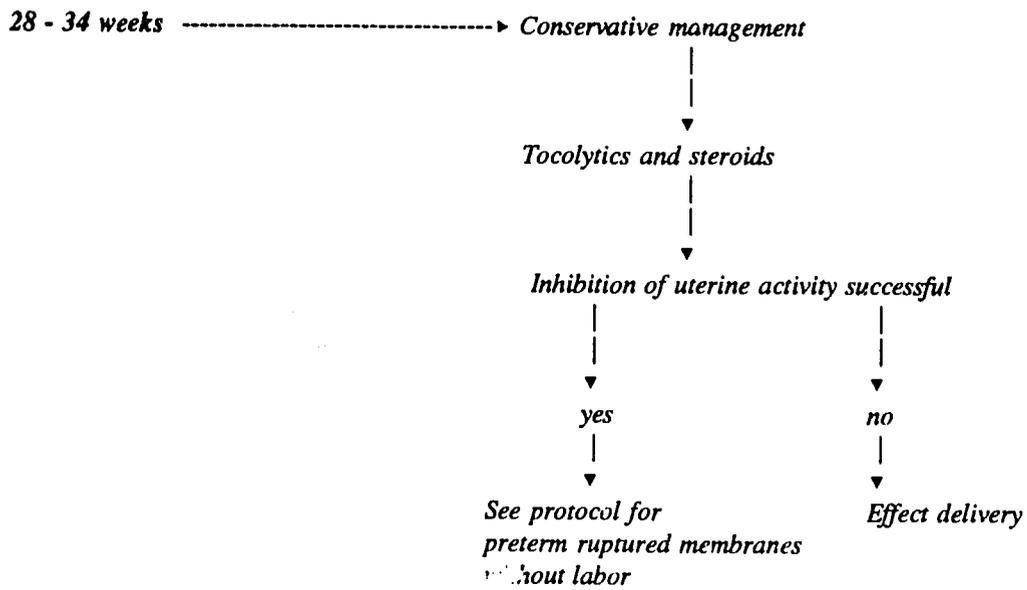
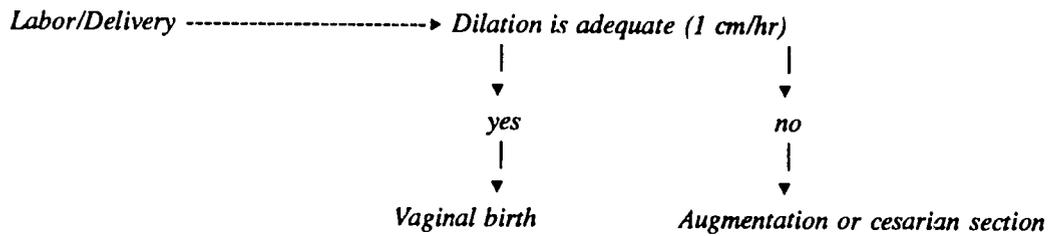
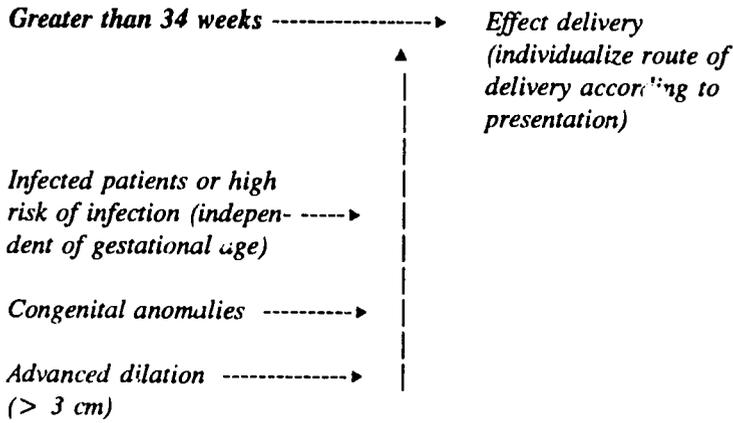
Greater than 34 weeks:

- Effect delivery.

IMPORTANT CONSIDERATIONS:

If tocolysis is successful, the patient must remain hospitalized until she gives birth. If there are no signs of infection, fetal compromise or labor, management is conservative until term (see protocol for management of preterm rupture of membranes without labor).

PRETERM LABOR WITH RUPTURED MEMBRANES



D. STANDARD ADMISSION ORDERS - RUPTURED MEMBRANES

Admit to labor and delivery ward.

Absolute bedrest in left lateral decubitus position.

Diet: Nothing by mouth for 4 - 6 hours. Evaluate according to case.

Vital signs: record every 30 minutes - blood pressure, maternal pulse, respirations and fetal heart rate. Record oral temperature every 4 hours.

Observation:

- Psychological attitude
- Pulse greater than or equal to 120/min
- Blood pressure less than or equal to 90/55 - 100/85 mm Hg
- Uterine activity (observe for 10 minutes every 20 minutes)
- Fetal heart rate less than 120/minute or greater than 160/minute and/or variations in fetal heart rate
- Hydration
- Fetal movements
- Vaginal bleeding
- Foul smelling amniotic fluid

Laboratory examinations:

- Complete blood count with differential every 24 hours
- Blood type and Rh
- Urinalysis and urine culture

- **V.D.R.L.**
- **C-Reactive protein every 48 hours**
- **Gram stain and culture of endocervical secretion/amniotic fluid**
- **Arbo:ization test of amniotic fluid**
- **Papanicolaou of cervical secretion**
- **Others (depending on associated medical problems)**

Intravenous fluids:

- **5% Dextrose at 120 ml/hour**

10. PRETERM RUPTURE OF MEMBRANES WITHOUT LABOR

DEFINITION:

- Rupture of the membranes more than 12 hours before the onset of labor in a pregnancy less than 37 weeks gestation.

RISK FACTORS:

- Multiple pregnancy, cervical surgery, polyhydramnios, infection.

PRINCIPAL CLINICAL SIGNS:

- Loss of clear, milky, yellow or brown liquid from the vagina. The patient complains of wetness, and more liquid may come out with physical activity.

LABORATORY EXAMINATIONS:

- "Ferning" or arborization of liquid on microscope slide, Papanicolaou of cervical secretion, test with Nitrazine paper.

MANAGEMENT:

- Hospitalization.
- Monitor for infection.
- Evaluation of fetal well-being a minimum of twice weekly.
- Steroids to induce pulmonary maturity weekly until 34 weeks are completed.
- Evaluation induction of labor at 37 weeks gestation or beforehand if pulmonary maturity is demonstrated or for other indication (e.g., signs of infection or fetal compromise).
- Be prepared for labor or signs of infection.

- **Breech presentation:** keep patient on strict bedrest in Trendelenburg position, monitor frequently for signs of prolapse of an extremity or the cord. Emergency cesarian section if prolapse occurs.
- **DISCHARGE:**
 - Discharge those patients who meet adequate home environment conditions and have sufficient personal motivation to care for themselves correctly: hygiene, condition of house, can attend hospital appointments, have easy access to transportation, etc.
 - Follow-up of these patients is weekly in the outpatient prenatal clinic.
 - Educate the patient thoroughly about her care in the home, including the following points:
 - Mark the thermometer at 37.3°C. (above 37.3°C. is considered abnormal). Take temperature twice a day.
 - Fetal movement counts.
 - Detecting foul odor in vaginal secretions.
 - No vaginal douching.
 - No sexual contact (no coitus).
 - Decreased physical activity.
 - Patients with a breech presentation should not be discharged.
 - Patients who have received steroids should not be discharged.

A. STANDARD ADMISSION ORDERS

Admit to antenatal ward.

Absolute bedrest in left lateral decubitus position.

Diet: Normal

Vital signs: record every 4 hours - blood pressure, maternal pulse, respirations, temperature and fetal heart rate.

Observations:

- Psychological attitude
- Uterine activity
- Hydrorrhea
- Fetal movements
- Vaginal bleeding
- Nausea and vomiting
- Foul smelling amniotic fluid

Laboratory examinations:

- Complete blood count
- Blood type and Rh
- Urinalysis and urine culture
- V.D.R.L.
- C-reactive protein
- Gram stain and culture of endocervical secretion/amniotic fluid
- Arborization test of liquid

- Papanicolaou of cervical secretion (presumed amniotic fluid)
 - Repeat white blood count every 24 hours and C-reactive protein every 48 hours. Leucocytosis is understood to be greater than 15,000 leucocytes per mm.

Medication:

- Steroids - Dexamethasone 12 mg I.M. every 12 hours for 2 doses in pregnancies less than 35 weeks gestation. Do not discharge patients who have received steroids.

Diagnostic Test :

- **Ultrasound:** To rule out fetal anomalies and estimate fetal weight. In the absence of an ultrasound examination, a simple abdominal X-ray can be useful for ruling out congenital anomalies such as anencephaly.
- **Non-stress test:** Perform in all pregnancies above 30 weeks gestation, if possible.
- **Amniocentesis:** When the obstetrician considers it necessary.
- **Evaluation of fetal well-being:** A minimum of twice weekly.
- **A gynecologic examination with a sterile speculum by the most experienced resident upon admission to the emergency room.**
- **Plain abdominal X-ray if fetal presentation is in doubt.**

11. POSTPARTUM ENDOMETRITIS

DEFINITION:

- Postpartum uterine infection.

RISK FACTORS:

- Management of labor/delivery under unhygienic conditions, multiple vaginal examinations, prolonged rupture of membranes, operative delivery, anemia, manual extraction of placenta, immunosuppression (diabetes, AIDS, etc.).

PRINCIPAL CLINICAL SIGNS:

- Elevation of oral temperature to 38.5°C for two consecutive days within the first 10 days postpartum.
- Abdominal and/or pelvic pain.
- Foul smelling or chocolate colored lochia.
- Uterine subinvolution.

LABORATORY EXAMINATIONS:

- Complete blood count (hematocrit, hemoglobin, white blood cell count plus differential, sedimentation rate).
- Cervical, uterine and urine cultures.
- Blood cultures according to case.

MANAGEMENT:

- Obtain cultures: urine, blood, lochia.
- Begin broad spectrum antibiotics (see protocol for Septic Abortion).
- Ergotrate 0.2 mg p.o. every 8 hours for three doses.

- Consider curettage if retained placental fragments are suspected.
- Monitor white blood cell count with differential plus sedimentation rate every 48 hours and according to clinical course.
- Ultrasound if fever spikes continue after 48 hours of antibiotic therapy, or if abdomino-pelvic masses appear.
- Change antibiotics according to culture sensitivity results or clinical course.
- Continue antibiotics for 7 days, or until the patient has been afebrile for a minimum of 48 hours.

12. SEPTIC ABORTION

DEFINITION:

- An abortion, either induced or spontaneous, in which the products of conception and/or the uterus are infected.

RISK FACTORS:

- Abortion induced outside of the hospital, neglected incomplete abortion.

PRINCIPAL CLINICAL SIGNS:

- Fever, constant lower abdominal pain, foul smelling vaginal bleeding or pus, pus in cervix, signs of attempted abortion: cervical or vaginal tears, foreign body in the vagina or cervix, vaginal perforations.

LABORATORY EXAMINATIONS:

- Complete blood count, blood cultures, gram stain and culture of endocervical secretion, plain and upright abdominal X-ray, pelvic ultrasound.

TREATMENT - MANAGEMENT:

- Admit patient to septic gynecology ward.
- Keep patient fasting.
- Draw all laboratory examinations and obtain all radiologic examinations (see A. Standard Admission Orders)
- Begin broad spectrum antibiotics stat.
- Begin intravenous solutions with oxytocin.
- Transfuse whole blood or packed red blood cells according to the patient's blood loss: if Hct < 30% or if there is heavy bleeding.
- Give tetanus vaccination.
- Uterine curettage 4-6 hours after initiating antibiotics and oxytocics.

IMPORTANT CONSIDERATIONS (PRE-CURETTAGE):

These patients must be treated promptly to prevent septic shock. Begin antibiotics immediately, and if the patient's condition worsens perform the curettage immediately also (do not wait the 4-6 hours).

If there are signs of uterine perforation or a foreign body radiographically, or if the patient deteriorates clinically, perform a total abdominal hysterectomy.

STANDARD POST CURETTAGE ORDERS:

- Diet: Nothing by mouth for 4-6 hours, then liquid diet if patient is stable.
- Modified bedrest.
- Record vital signs every 30 minutes for 2 hours, then per routine if normal:
 - Blood pressure
 - Pulse
 - Oral temperature
 - Respirations
- Laboratory examinations: Hematocrit 6 hours post curettage.
- Observations:
 - Psychological attitude
 - Hydration
 - Fever, pain
 - Hypotension
 - Tachycardia
- Medications:
 - Ergotrate 0.2 mg I.M./p.o. every 8 hours for 3 doses.
 - Dipirona 500 mg p.o. every 8 hours PRN or Acetaminophen 1 gm. p.o. every 6 hours PRN pain.
 - Continue antibiotics.
 - Discontinue oxytocin when the first 500 ml of solution have finished infusing.

IMPORTANT CONSIDERATIONS (POST CURETTAGE):

If the patient improves and has a urine output greater than 30 ml/hr, remove Foley catheter and consider discharge 72 hours after curettage. Evaluate pulse, respirations, blood pressure, oral temperature and capillary filling prior to discharge.

If the patient does not improve and is tachycardic, tachypneic, hypotensive and/or febrile; if there is resistance to the antibiotics; if there is oliguria or a marked decrease in urinary output; **THEN**

- Hydrate the patient,
- Change the antibiotics according to the sensitivities,
- Re-evaluate patient.
- If patient still does not improve, consider hysterectomy plus salpingo-oophorectomy (if adnexae are involved in the infectious process).

Always monitor for signs of septic shock (see protocol for septic shock). Early treatment of septic shock is the most important part of saving a patient's life.

A. STANDARD ADMISSION ORDERS

Admit to gynecology ward.

Diet:

- Nothing by mouth until new order

Absolute bedrest in semifowler position.

Record vital signs every 30 minutes for 2 hours (then according to medical evaluation):

- Blood pressure
- Pulse
- Oral temperature (or axillary or rectal)
- Central venous pressure (if case merits this)
- Respirations
- Hourly intake and output

Observations:

- Psychological attitude
- Hydration
- Changes in conduct
- Hypo-hyperthermia
- Hypo-hypertension
- Tachypnea-tachycardia
- Vaginal bleeding
- Abdominal distension

Laboratory examinations:

- Complete blood count (hemoglobin, hematocrit, differential, sedimentation rate)
- Blood type and Rh
- Blood chemistries and hepatic function tests:
 - Creatinine, BUN
 - Glucose
 - Sodium, potassium
 - Bilirubins
 - Transaminases
- Coagulation profile
 - Prothrombin time and partial thromboplastin time
 - Platelet count
 - Fibrinogen
 - Clot retraction time
- Blood cultures (at least two 15-30 minutes apart)
- Peripheral smear
- Gram stain and culture of endocervical secretion
- Urinalysis and urine culture

Medication:

- Antibiotics
 - First Choice
 - Ampicillin 1 gm I.V. every 4-6 hours -OR- Penicillin G 4-5 million IU I.V. every 4-6 hours;
 - PLUS-
 - Clindamycin 900 mg I.V. every 8 hours -OR- Metronidazole 1 gm I.V. stat, then 500 mg I.V. every 6 hours (infuse over 20 minutes);
 - PLUS-

- Gentamicin 3-5 mg/kg/day I.V. divided into three doses. First dose stat, then every 8 hours. (Readjust dose based on patient's creatinine level.)
- o Second Choice:
 - Ampicillin 1 gm I.V. every 4-6 hours -OR- Penicillin G 4-5 million IU I.V. every 4-6 hours;
 - PLUS-
 - Chloramphenicol 1 gm I.V. every 6 hours.
- o Third Choice:
 - Metronidazole 1 gm I.V. stat, then 500 mg I.V. every 6 hours (infuse over 20 minutes);
 - PLUS-
 - Third generation cephalosporin.
- o Other Combinations
 - Penicillin PLUS Gentamicin;
 - Chloramphenicol plus Gentamicin;
 - Clindamycin plus Gentamicin;
 utilizing the doses mentioned above.

Note: Antibiotics should be evaluated 48 hours after beginning them to make changes in drugs or their route of administration according to the patient's course.

- Oxytocics:
 - o Oxytocin 20-25 IU in 500 ml Hartmann's or Ringer's lactate; begin at 20-25 drops/minute I.V.
- Tetanus prophylaxis:
 - o Administer according to previous immunization record: Human 350-500 IU
 - OR-
 - Equine 300-600 IU.
 - Both subcutaneous.

Treatment:

- I.V. fluids - saline or Hartmann's at 125 ml/hour (evaluate according to patient's requirements).
- Whole blood or packed red blood cells; according to patient's loss - keep Hct. above 30%.

- **Record intake and output every hour.**
- **Foley catheter.**
- **Nasogastric tube on continuous suction, as needed.**
- **Intravenous angiocath No.16-18.**
- **Placement of central line and notation of central venous pressure every 30 minutes PRN.**
- **Abdominal X-ray - plain and upright.**

Present patient to chief on call and then to chief of service.

Report any changes stat.

13. SEPTIC SHOCK

DEFINITION:

- A morbid condition caused by an infectious focus, in which the patient's functional intravascular volume is less than the capacity of the circulatory system of the body, resulting in low blood pressure and diminished tissue perfusion. Without treatment, the resulting cellular acidosis and hypoxia cause terminal organ tissue dysfunction and death.

RISK FACTORS:

- Septic abortion, postpartum endometritis, anemia, emergency surgery, immunosuppression.

DIAGNOSIS (PRINCIPAL CLINICAL SIGNS):

- Physical findings:
 - Initial phase
 - Chills
 - Hyperthermia
 - Tachycardia and Tachypnea
 - Warm extremities
 - Nausea, vomiting
 - Cardiac arrhythmias
 - Diarrhea
 - Sudden change in psychological attitude
 - Late phase
 - Cold extremities
 - Oliguria - Anuria
 - Hypothermia
 - Peripheral cyanosis
 - Hypotension
 - Tachypnea, dyspnea
 - Metabolic acidosis
 - Cardiac arrhythmias
 - Further deterioration in psychological attitude

- **Laboratory findings:**
 - Leucocytosis
 - Hyperglycemia
 - Changes in coagulation system
 - platelets
 - fibrinogen
 - PT, PTT
 - Respiratory alkalosis, then metabolic acidosis.

□ **MANAGEMENT:**

- **INITIAL TREATMENT:**
 - Resuscitation
 - A - B C
 - Airway - Breathing - Circulation
 - Intravenous line x 2
 - 1 Central
 - 1 Peripheral
 - Laboratory examinations
 - Transaminases and bilirubins (liver function tests)
 - Bacterial culture and gram stain of suspected focus of infection
 - Blood culture x 2
 - Complete blood count (hemoglobin, hematocrit, white blood cell count and differential, sedimentation rate)
 - PT, PTT, fibrinogen
 - Sodium, potassium
 - Creatinine, BUN
 - Blood glucose
 - Urinalysis and urine culture
 - Platelet count
 - Chest X-ray
 - Abdominal X-ray supine and seated
 - Electrocardiogram
 - Foley catheter
 - O₂ via nasal cannula at 3 liters/minute
 - Intravenous fluids
 - Crystalloids (Hartmann's, Ringer's lactate or saline)
 - * One liter over 30 minutes while completing the above mentioned tasks.
 - * Measure CVP
 - If CVP is greater than 12 cm H₂O, maintain fluids at 125 ml/hr, monitoring CVP every hour.

- If CVP is less than 12 cm H₂O, give 200 ml crystalloid, wait 5 minutes and check CVP. Repeat 200 ml fluid bolus every 10 minutes until CVP = 12 cm H₂O.

-OR-

- **Colloids (Hematocele, Rheomacrodex, Macrodex, Albumen) ****

- * 500ml over 30 minutes while completing the above-mentioned tasks.
- * Measure CVP
 - If CVP is greater than 12 cm H₂O, maintain fluids at 125 ml/hr, monitoring CVP every hour.
 - If CVP is less than 12 cm H₂O, give 200 ml colloid, wait 5 minutes and check CVP. Repeat 200 ml fluid bolus every 10 minutes until CVP = 12 cm H₂O.

**** Do not use colloids in the presence of respiratory insufficiency (see below).**

o **Medications**

- **Antibiotics (Begin immediately)**

- * **First Choice**
 - Ampicillin 1 gm I.V. every 4-6 hours -OR-
 - Penicillin G 4-5 million IU I.V. every 4-6 hours;
 - PLUS-
 - Clindamycin 900 mg I.V. every 8 hours
 - OR-
 - Metronidazole 1 gm I.V. stat, then 500 mg I.V. every 6 hours (infuse over 20 minutes);
 - PLUS-
 - Gentamicin 3-5 mg/kg/day I.V. divided into three doses. First dose stat, then every 8 hours. (Adjust dose based on patient's creatinine level.)
- * **Second Choice**
 - Clindamycin 900 mg I.V. every 8 hours;
 - PLUS-
 - Gentamicin 3-5 mg/kg/day divided into 3 doses.
- * **Third Choice**
 - Penicillin G 4-5 million IU I.V. every 4-6 hours
 - OR-
 - Ampicillin 1 gm I.V. every 4-6 hours;
 - PLUS-
 - Chloramphenicol 1 gm I.V. every 6 hours.
- * **Other alternatives**
 - Third generation cephalosporin PLUS Metronidazole.

- Vasopressor - utilized when there has been no response to fluids (patient is still hypotensive).
 - * Dopamine: Use only with microdrip and always with a cardiac monitor. Dose = 5 mcg/kg/min.
 - Put 400 mg dopamine into 500 ml 5% Dextrose.
 - To determine infusion rate:

$$\# \text{ drops/min} = \frac{\text{dose} \times (\text{weight in kg})}{13.3}$$

Ex: 50 kg patient

$$\# \text{ drops/min} = \frac{5 \text{ mcg} \times (\text{kg weight})}{13.3}$$

$$\# \text{ drops/min} = \frac{5 \times 50}{13.3}$$

$$\# \text{ drops/min} = 18.79 \text{ ---} \rightarrow 19 \text{ drops/min.}$$

- Initiate at 5 mcg/kg/min and ↑ by 2 mcg/kg/min every 10 minutes to a maximum of 12 mcg/kg/min.
- If there is no response at 12 mcg/kg/min (no ↑ urinary output and/or no ↑ in blood pressure), check for:
 - Hypovolemia - especially if the patient has ventricular or supraventricular extrasystoles.
 - Metabolic acidosis - change in mental status plus tachycardia, cyanosis or peripheral hypoperfusion.
- If there is no response to fluids plus dopamine, metabolic acidosis probably exists. Give sodium bicarbonate in bolus through a separate line from the dopamine as follows:
Sodium bicarbonate 88 meq (2 ampules of 44 meq) -OR-
Ten ampules of 7.5% sodium bicarbonate.
Continue dopamine at the same dose.

- **Respiratory support**
 - If respiratory insufficiency or ARDS exists, this is an indication for intubation and assisted ventilation in the intensive care unit.
 - Signs of respiratory insufficiency:
 - Dyspnea
 - Use of accessory respiratory muscles
 - Nasal flaring
 - Peripheral cyanosis
 - Chest X-ray shows:
 - Diffuse interstitial bilateral infiltrates.

IMPORTANT CONSIDERATIONS:

Patients with septic shock should be managed jointly with the department of medicine.

EVALUATE surgery as soon as the initial management steps have been completed:

- **CURETTAGE** to remove infected products of conception in postpartum patients and those with septic abortions.
- **LAPAROTOMY** in patients post cesarian section and in patients with evidence of uterine perforation, suspicion of *Clostridia welchii* infection, or an intra-abdominal foreign body. Evaluate hysterectomy and/or salpingo-oophorectomy.

Patients with pregnancies greater than 20 weeks gestation should be managed in the left lateral position or with lateral uterine displacement.

Monitor for cardiac arrhythmias.

Monitor for DIC, and treat it with plasma together with the hematologist.

Treat renal insufficiency early and vigorously. Signs of renal insufficiency: Anuria and a CVP \geq 12 mm H₂O in a patient who:

- Has received fluids (crystalloids, colloids etc.)
- Has received vasopressor
- Does not have cardiac insufficiency

Treatment of renal insufficiency:

- Furosemide 100 mg I.V. when there is anuria, to maintain urine output at a minimum of 30 ml/hr. (NOTE: If the furosemide does not produce results and the patient does not begin to urinate, look for another etiology for the anuria. Do not give more furosemide if it is not having any effect.)
- Continue maintenance fluids only.

Dopamine can be a dangerous drug. In high doses, dopamine has a vasoconstrictive effect which will worsen your patient's condition. Use it carefully (see table below).

DOPAMINE

400 mg (2 vials)/500ml = 0.8 mg/ml

WEIGHT		DOSAGE (mg/kg/min)							
lb	kg	1.0	2.5	5.0	7.5	10.0	12.5	15.0	20.0
88	40	3	8	15	22	30	37	45	60
99	45	4	9	17	25	34	42	50	67
110	50	4	9	19	28	38	47	56	75
121	55	5	10	21	31	42	51	62	82
132	60	5	11	23	34	45	56	68	90
143	65	5	12	24	36	49	61	74	97
154	70	6	13	26	39	52	66	79	104
165	75	6	14	28	42	56	70	84	112
176	80	7	15	30	44	60	75	90	120
187	85	7	16	32	47	64	80	96	128
198	90	8	17	34	51	68	84	101	136
209	95	8	18	36	53	72	90	107	143
220	100	8	19	37	56	75	94	113	150

Flow rate
in
drops/min
based on
microdrip
60 drops =
1 ml

14. INTRAUTERINE FETAL DEATH

DEFINITION:

- The intrauterine death of a fetus.

RISK FACTORS:

- Diabetes mellitus, abruptio placenta, congenital anomalies, hypertension, history of fetal death.

PRINCIPAL CLINICAL SIGNS:

- Lack of fetal movements, lack of growth of fundal height, inability to auscultate fetal heartbeat.

LABORATORY EXAMINATIONS:

- Ultrasound:
 - Lack of fetal cardiac motion.
- X-rays:
 - Spalding's sign (overlapping cranial bones)
 - Presence of gas in the fetal circulation
 - Excessive angulation of the fetal spine.
- Amniocentesis:
 - The extraction of turbid, brown liquid in a situation suggestive of fetal death supports the diagnosis.

MANAGEMENT:

- Prenatal Period:
 - Make a certain diagnosis, confirmed by ultrasound when possible, always consulting with a 3rd year resident or the chief on call.
 - If ultrasound is not possible, get an abdominal X-ray looking for signs of fetal death.
 - Draw all routine laboratory examinations.
 - Draw complete coagulation profile: Prothrombin time, partial

- thromboplastin time, platelet count, fibrinogen.
- Emotional support.
- **When the uterus is less than 12 weeks size:**
 - Suction curettage under general or local anesthesia.
- **When the uterus is between 13-19 weeks size:**
 - Induce abortion with prostaglandins:

NOTE: Asthma and **CARDIOVASCULAR DISEASES** are contraindications for the use of prostaglandin E₂.

- Place three 3 mg. tablets of prostaglandin E₂ (dinoprostone) in the posterior fornix. Keep the patient lying down for at least one hour after placement of the tablets. Repeat every 6 hours if necessary, to a maximum of four doses.
- Perform a curettage after the products of conception have passed.
- **ADVERSE EFFECTS OF PROSTAGLANDINS:** These can be treated with antiemetic and antidiarrheal medications as follows:
 - antiemetics
 - * Oral route, Metaclopramide 10 mg p.o. every 6 hours.
 - * Parenteral route, Dimenhydrinate (Nauseol) one 5 ml (50 mg) ampule I.M. or I.V. every 6 hours.
 - antidiarrheal
 - * Bentogel (kaolin, pectin) 3 teaspoons p.o. every 6 hours.
 - * Pectin suspension (kaolin, pectin, sulfaguanidine, atropine methylbromide) 3 teaspoons p.o. every 4 hours.
- **When the uterus is larger than 20 weeks size:**
 - Two options should be presented to the patient:
 - Conservative treatment with emotional support, awaiting the onset of spontaneous labor (spontaneous evacuation two weeks post mortem = 75%, three weeks post mortem = 89%). Coagulation profile weekly, with induction of labor if there is any alteration in the coagulation studies or if spontaneous labor has not started at three weeks post mortem.
 - Induction of labor upon confirming the diagnosis:
 - * Oxytocin induction according to induction protocol.
 - * If the first induction fails, induce for a second time the following day.

- Amniotomy only when dilation is 3 cm or greater and uterine activity is well established.
- If the second oxytocin induction fails, induction with prostaglandins can be considered

NOTE: ASTHMA and CARDIOVASCULAR DISEASES are contraindications for the use of prostaglandin E₂:

- Place one 3 mg. tablet of prostaglandin E₂ (dinoprostone) in the posterior fornix. Keep the patient lying down for at least one hour after placement of the tablet. Repeat in 6 hours if necessary. Oxytocin may be initiated 4 hours after the placement of the last prostaglandin tablet if necessary. Never use oxytocin and prostaglandins simultaneously.

ADVERSE EFFECTS OF PROSTAGLANDINS: These can be treated with antiemetic and antidiarrheal medications as follows:

- o antiemetics
 - Oral route, Metaclopramide 10 mg p.o. every 6 hours.
 - Parenteral route, Dimenhydrinate (Nauseol) one 5 ml (50 mg) ampule I.M. or I.V. every 6 hours.
- o antidiarrheal
 - Bentogel (kaolin, pectin) 3 teaspoons p.o. every 6 hours.
 - Pectin suspension (kaolin, pectin, sulfaguanidine, atropine methylbromide) 3 teaspoons p.o. every 4 hours.

IMPORTANT CONSIDERATIONS:

Consult with the chief on call and the hematologist when there are signs of Disseminated Intravascular Coagulation (DIC).

If there is hemorrhage and signs of DIC, **DO NOT USE HEPARIN**. Use only support measures with blood and fresh frozen plasma transfusions, and immediately empty the uterus vaginally.

Twin gestations: If one twin dies in utero, DIC can develop in the mother or in the surviving twin. When one twin has died at term, the surviving twin must be delivered. If a twin dies prematurely, hospitalize the patient and monitor her coagulation profile weekly. Interrupt the pregnancy at the first sign of alterations in the coagulation profile.

Postpartum care and counselling:

- Determine the cause of fetal death in order to counsel the patient about the risk of recurrence.
- Give the couple emotional support.
- Stillborn babies must be autopsied and cultured for bacteria.

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APPENDIX

DIABETIC DIETS

All pregnant women, diabetic or not, need a good diet to provide the nutrients required for the growth of their body and the fetus, and for the production of sufficient milk postpartum.

For adequate growth and development, various foods are needed to provide energy, proteins, calcium, iron and vitamins. Special care must be taken in the selection of foods during pregnancy and lactation in order to consume the amounts that are truly needed. In general, pregnant or nursing mothers should eat a normal diet that meets the calculated energy and protein requirements necessary to assure the mother's health. Diabetic mothers should also follow a good diet, but with some restrictions.

For a healthy, non diabetic mother of average weight (110-121 lbs.), the nutritional requirements are as follows:

	Calories (kcal)	Proteins (g)	Vitamin A (Meq R)	Iron (mg)	Iodine (mg)
Adult woman	2,050	45	630	18	150
Pregnant woman	2,300	53	730	30	175
Nursing woman	2,500	67	795	30	200

Diabetic mothers will need roughly the same nutrients, but will need to be more careful in terms of where and how they obtain these nutrients. The diets that follow are examples of ways diabetic mothers can fulfill their nutritional requirements while maintaining reasonable blood glucose levels. The menus can be used to help diabetic and non-diabetic mothers alike understand what is meant by a "good diet."

DIABETIC DIETS

- **Definition:** A normal diet with restrictions in the total content of carbohydrates. The amount of carbohydrates provided by this diet varies between 100 and 300 grams daily.

- **Objectives:**
 - Maintain normal blood glucose levels.
 - Provide a nutritionally balanced diet adequate for the attainment and maintenance of a healthy mother and baby at the end of pregnancy.
 - Avoid complications such as obesity, fetal macrosomia, ketosis and others.

- **Foods Prohibited in the Diet:**
 - Atolls (sweetened or non sweetened grain drinks), chocolate, fatty meats, beets, sweet fruits, sweetened fruit juices, cakes, soups and sauces thickened with flour, bread or tortillas in large quantities, excess fat, sugar, honey, brown sugar, jellies, gelatin, flan (puddings), traditional candies.

- **How to Calculate a Diet for your Pregnant Diabetic Patient:**
 - Ideal body weight x 35-40 kcal/kg \pm 270 = number of calories required per day
Ideal body weight is calculated from the attached table.

Example:
50 kg x 40 kcal/kg \pm 270 = 2270 kcal per day

- **Examples of menus:**
 - **1500 calorie diabetic diet (adult)**

Breakfast: 1/2 cup milk or incaparina without sugar
1 soft or hard boiled egg
1/2 cup refried beans
1 portion bread
1 cup of tea without sugar (not black tea)

Snack: 1 banana
1/2 cup milk or incaparina without sugar

Lunch: 3 oz. beef or chicken
1/2 cup rice, pasta or potatoes
1/2 cup tomato or cucumber salad
1/2 cup green vegetable
2 tortillas
1 orange or 1/2 cup papaya or pineapple
1 cup lemonade without sugar

Snack: 1/2 cup fruit

Dinner: 2 oz. meat, chicken or cheese
1/2 cup refried beans
1/2 cup squash or carrots
1/2 cup papaya, banana, apple or mango
2 tortillas or portions of bread
1 cup tea without sugar (not black tea)

Snack: 1 cup milk or incaparina without sugar

Note: Use 4 teaspoons of vegetable oil per day for cooking the food.

o **2000 calorie diabetic diet (adult)**

Breakfast: 1 cup milk or incaparina without sugar
1 soft or hard boiled egg
1/2 oz. (1 tablespoon) margarine
2 portions bread
1 cup of tea without sugar (not black tea)

Snack: 1 banana
1/2 cup milk or incaparina without sugar

Lunch: 4 oz. beef/chicken/fish/rice and beans
1/2 cup rice, pasta or potatoes
1 cup vegetable salad (any vegetable)
1/2 cup leafy green vegetable
2 tortillas
1 orange or 1/2 cup papaya
1 cup lemonade without sugar

Snack: 1/2 cup fruit

Dinner: 2 oz. beef/chicken/cheese
1/2 cup refried beans
1/2 cup squash or carrots
1/2 cup papaya, banana, apple or mango
2 tortillas or portions of bread
1 cup tea without sugar (not black tea)

Snack: 1 cup milk or incaparina without sugar

Note: Use 12 teaspoons of vegetable oil per day for cooking the food.

o **3000 calorie diabetic diet (adult)**

Breakfast: 1 cup milk or incaparina without sugar
1/2 cup orange juice
2 soft boiled, hard boiled, or fried eggs
3 portions bread
1 cup of tea without sugar (not black tea)

Snack: 1/2 cup orange juice or 1 banana
1 portion bread with margarine

Lunch: 1/2 cup defatted beef or chicken soup
3 oz. meat
1/2 cup rice, pasta or potatoes
1 cup vegetable salad (any vegetable)
1/2 cup leafy green vegetable
6 tortillas
1 cup milk or incaparina without sugar
1 cup lemonade without sugar

Snack: 1/2 cup papaya or pineapple
1 portion bread with margarine
1 cup tea without sugar (not black tea)

Dinner: 1/2 cup defatted chicken or beef soup
3 oz. meat
1/2 cup refried beans
1/2 cup rice, pasta or potatoes
1/2 cup squash or carrots
1/2 cup fruit
4 tortillas or portions of bread
1 cup tea without sugar (not black tea)
1 cup milk or incaparina without sugar

Snack: 1 cup milk or incaparina without sugar
1 portion bread with margarine

Note: Use 12 teaspoons of vegetable oil per day for cooking the food.

DIABETIC DIET PORTIONS

FOODS:	1,200	1,500	1,800	2,000
BREAKFAST	= =	= =	= =	= =
1. Incaparina + milk without sugar	240 ml/1 cup	240 ml/1 cup	240 ml/1 cup	240 ml/1 cup
2. 1 egg or 1 oz. cheese	hard or soft boiled 1 oz./1 portion without fat	hard or soft boiled 1 oz./1 portion without fat	hard or soft boiled 1 oz./1 portion with fat	hard or soft boiled 1 oz./1 portion with fat
3. Refried beans or platano	1/2 cup beans or 1/4 platano without fat	1/2 cup beans or 1/4 platano without fat	1/2 cup beans or 1/4 platano with fat	1/2 cup beans or 1/4 platano with fat
4. Sliced bread	1 slice	1 slice	1 slice	1 slice with margarine
5. Fruit	1 portion	1 portion	1 portion	1 portion
MORNING SNACK	= =	= =	= =	= =
1. Incaparina with milk	-----	-----	120 ml 1/2 cup	120 ml 1/2 cup
2. Fruit	1 portion	1 portion	1 portion	1 portion
3. Tea without sugar	240 ml	240 ml	120 ml	120 ml
LUNCH	= =	= =	= =	= =
1. Chicken or beef	3 oz. without fat	3 oz. without fat	3 oz. without fat	4 oz. with fat

FOODS:	1,200	1,500	1,800	2,000
2. Rice, pasta or potatoes	1/2 cup without fat	1/2 cup without fat	1/2 cup with fat	1/2 cup with fat
3. Salad (lettuce, tomato, green beans, cucumber)	1/2 cup	1/2 cup	1/2 cup	1/2 cup
4. Tortillas	1 portion	2 portions	2 1/2 portions	3 portions
5. Refreshment without sugar	240 ml	240 ml	240 ml	240 ml
AFTERNOON SNACK	= =	= =	= =	= =
1. Tea without sugar	240 ml	240 ml	240 ml	240 ml
DINNER	= =	= =	= =	= =
1. Meat, cheese or egg	1 portion or 1 oz. without fat	2 portions cheese or 2 oz. meat without fat	2 portions cheese or 2 oz. meat with fat	2 portions cheese or 2 oz. meat with fat
2. Incaparina + milk without sugar	240 ml	240 ml	240 ml	240 ml
3. Beans or platano		1/2 cup beans or 1/4 platano without fat	1/2 cup beans or 1/4 platano with fat	1/2 cup beans or 1/4 platano with fat

IDEAL WEIGHT FOR ADULT WOMEN

HEIGHT (in cm)	Ideal Weight (kg) for adults			HEIGHT (in cm)	Ideal Weight (kg) for adults		
	Light Build	Medium Build	Heavy Build		Light Build	Medium Build	Heavy Build
142	41.5	45.1	48.7	157	48.7	53.5	58.3
143	42.0	45.7	49.4	158	49.1	54.0	58.9
144	42.4	46.2	50.0	159	49.6	54.6	59.6
145	42.9	46.8	50.6	160	50.0	55.2	60.2
146	43.4	47.3	51.3	161	50.5	55.7	60.8
147	43.9	47.9	51.9	162	51.0	56.3	61.5
148	44.4	48.5	52.5	163	51.5	56.8	62.1
149	44.8	49.0	53.2	164	52.0	57.4	62.7
150	45.3	49.6	53.8	165	52.5	57.9	63.4
151	45.8	50.1	54.5	166	53.0	58.5	64.0
152	46.3	50.7	55.1	167	53.4	59.1	64.5
153	46.7	51.2	55.7	168	53.9	59.6	65.3
154	47.2	51.8	56.4	169	54.4	60.2	66.0
155	47.7	52.4	57.0	170	54.9	60.7	66.6
156	48.2	52.9	57.6				

Source: Casillas, O.E. y Vargas, L.A.; Cuadros de peso y talla para adultos mexicanos. Arch. Invest. Méd. (Méx.) 11:157-174. 1980. PLM.-
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